

2014-1534, -1558

In The
United States Court of Appeals
For The Federal Circuit

WRIGHT MANUFACTURING, INC.,

Appellant,

v.

THE TORO COMPANY,

Appellee.

**APPEALS FROM THE UNITED STATES PATENT AND
TRADEMARK OFFICE, PATENT TRIAL AND APPEAL BOARD
RE: REEXAMINATION NOS. 95/001,741 AND 95/001,742.**

BRIEF OF APPELLANT

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Dated: September 29, 2014

Form 9

FORM 9. Certificate of Interest**UNITED STATES COURT OF APPEALS FOR THE FEDERAL CIRCUIT**Wright Manufacturing, Inc. v. The Toro CompanyNo. 14-1534**CERTIFICATE OF INTEREST**

Counsel for the (appellant)

Wright Manufacturing, Inc. certifies the following (use "None" if applicable; use extra sheets if necessary):

1. The full name of every party or amicus represented by me is:

Wright Manufacturing, Inc.

2. The name of the real party in interest (if the party named in the caption is not the real party in interest) represented by me is:

The party named in the caption is the real party in interest

3. All parent corporations and any publicly held companies that own 10 percent or more of the stock of the party or amicus curiae represented by me are:

There is no parent corporation, and no publicly held company owns 10 percent or more of the stock of the party represented by me.

4. ☒ The names of all law firms and the partners or associates that appeared for the party or amicus now represented by me in the trial court or agency or are expected to appear in this court are:

Nixon & Vanderhye P.C. - Joseph A. Rhoa6/24/2014

Date

/s/ Joseph A. Rhoa

Signature of counsel

Joseph A. Rhoa

Printed name of counsel

Please Note: All questions must be answered

cc: _____

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STATEMENT OF RELATED CASES

Cases 14-1534 and 14-1558 have been consolidated for this appeal. (Dkt. Entry 21 in No. 14-1534.) This consolidated appeal thus represents an appeal from decisions by the United States Patent and Trademark Office's (USPTO's) Patent Trial and Appeal Board (PTAB) regarding *Inter Partes* Reexamination Nos. 95/001,741 and 95/001,742.

Appellant Wright Manufacturing, Inc. (Wright) is unaware of any other appeals or petitions taken in these reexaminations. However, there is a related district court litigation between the parties involving the two patents at issue here. *Wright Manufacturing, Inc. v. The Toro Company and Exmark Manufacturing Co., Inc.*, in the U.S. District Court for the District of Maryland, Civil Action No. 11-cv-01373-MJG. The parties agreed to stay the litigation in 2011.

I. JURISDICTIONAL STATEMENT

This appeal arises from two related *inter partes* reexaminations before the USPTO. Wright Manufacturing, Inc., the patent owner, appealed the examiner's final rejections in *Inter Partes* Reexamination Nos. 95/001,741 and 95/001,742 to the Board of Patent Appeals and Interferences on June 4, 2012, which had jurisdiction under 35 U.S.C. §§ 6, 134, and 315(a)(1). (A752-A758, A1739-A1745.) The Patent Trial and Appeal Board (PTAB) was then established and rendered decisions in the appeals. (A1-A66.) The PTAB's final Decisions on Requests for Rehearing were issued on February 14, 2014. (A26-A33, A59-A66.) Wright Manufacturing, Inc. then filed Notices of Appeal in a timely manner on April 14, 2014. (A1093-A1130, A2070-A2107, Foster Decls., ¶¶ 2-5 at Dkt. Entry 12 in 14-1534 and Dkt. Entry 10 in 14-1558.) Wright also mailed the Notices of Appeal to the General Counsel's office of the USPTO on April 14, 2014. (Foster Decls., ¶¶ 2-3 at Dkt. Entry 12 in 14-1534 and Dkt. Entry 10 in 14-1558.) The USPTO, in its Notice Forwarding Certified List for each matter, stated that the Notice of Appeal for each reexamination "was timely filed on April 14, 2014." (A1131, A2108.)

This Court has jurisdiction under at least 28 U.S.C. § 1295(a)(4)(A).

II. STATEMENT OF THE ISSUES

Whether it would have been obvious to have modified a base reference where the added feature would serve no purpose or function in the base reference as allegedly modified and would be inoperative.

III. STATEMENT OF THE CASE

Appellant Wright Manufacturing, Inc. (“Wright”) and Appellee The Toro Company (“Toro”) are direct competitors in the commercial lawn mower business. Wright manufactures mowers, at its facility in Frederick, Maryland, under both the “Wright” and “John Deere” brand names. (A1029.) Wright has approximately 175 employees. Wright revolutionized the commercial mower industry by developing and commercially introducing stand-on mowers. Toro followed. While others have taken licenses of Wright patents, Toro has not.

In 2011, Wright filed an infringement suit against Toro in Baltimore asserting infringement of the patents at issue here. Toro then filed *inter partes* reexamination 95/001,741 regarding U.S. Patent No. 6,438,931 (the ’931 patent; A67-A103) and *inter partes* reexamination 95/001,742 regarding U.S. Patent No. 6,935,093 (the ’093 patent; A104-A139). The parties agreed to stay the litigation in 2011.

Regarding reexamination 95/001,741, original claims 1-14 of the ’931 patent remain and have not been amended, and new dependent claims 15-40 were added

during the reexamination. (A103, A466-A470, A818-A825.) During reexamination 95/001,742, claims 1 and 4 of the '093 patent were amended, claims 2 and 5 of the '093 patent were canceled, claims 3 and 6 of the '093 patent were not amended, and new dependent claims 7-17 were added. (A139, A1487-A1491, A1788-A1793.) The Patent Trial and Appeal Board (PTAB) ruled against Wright in the reexaminations, finding the claims obvious over a combination of at least six (6) references. In particular and at issue here, the PTAB ruled that:

- A. Original claims 1-3, 7, 9-11 and 13 of the '931 patent in 95/001,741 and claims 1, 3, 4 and 6-17 in 95/001,742 were obvious under 35 U.S.C. § 103 over at least Velke '031 (U.S. Patent No. 5,984,031 at A2190-A2220) in view of Cox (A334-A345), Musgrave (U.S. Patent No. 3,460,325 at A2128-A2136), Busboom (U.S. Patent No. 5,816,033 at A2174-A2181), Hale '536 (U.S. Patent No. 3,402,536 at A2112-A2118), and Hale '798 (U.S. Patent No. 3,408,798 at A2119-A2127). This was Rejection 9 in 95/001,741 and Rejection 6 in 95/001,742. (A1-A66.)
- B. Original claims 1-3, 7, 9-11 and 13 of the '931 patent in 95/001,741 and claims 1, 3, 4, 6-14, 16 and 17 in 95/001,742 were obvious under 35 U.S.C. § 103 over at least Wright '138 (U.S. Patent No. 5,507,138 at A2137-A2144) in view of Cox, Musgrave,

Busboom, Hale '536, and Hale '798. This was Rejection 5 in 95/001,741 and Rejection 4 in 95/001,742. (A1-A66.)

The PTAB did not reach Rejections 14-17 in 95/001,741 (A24). All other obviousness rulings by the PTAB rely on the two above-identified rejections. If these two rejections are found to be incorrect, all other rejections necessarily fall. Wright appealed the unpatentability findings to this Court.

The PTAB's initial decisions and final decisions on rehearing, and a copy of the '931 patent, are included in the Addendum hereto.

A. The '931 and '093 Patents.

The '931 patent (A67-A103) and the '093 patent (A104-A139) have essentially the same specification and the same drawings. The specifications and drawings of the '931 and '093 patents are assumed to be the same for purposes of this appeal. The '093 patent is a continuation of the '931 patent. Both patents are owned by Wright Manufacturing, Inc. (Wright), a Maryland corporation. The inventors of both the '931 and '093 patents are Maryland residents James D. Velke and William R. Wright. These same inventors (Velke and Wright) are also the inventors of the Velke '031 (A2190-A2220) and Wright '138 (A2137-A2144) base references applied by the PTAB in the 6+ way obviousness combinations.

Given that the specifications/drawings of the '931 and '093 patents are essentially the same, Wright will refer to the '931 patent specification and

drawings herein for purposes of convenience, with cites to the '931 patent equally applying to corresponding cites in the '093 patent.

Representative claim 1 of the '931 patent is set forth below.

1. A self-propelled power lawn mower comprising:

first and second rear drive wheels that are independently driveable so as to enable the mower to conduct approximate zero radius turns about a zero radius turning axis;

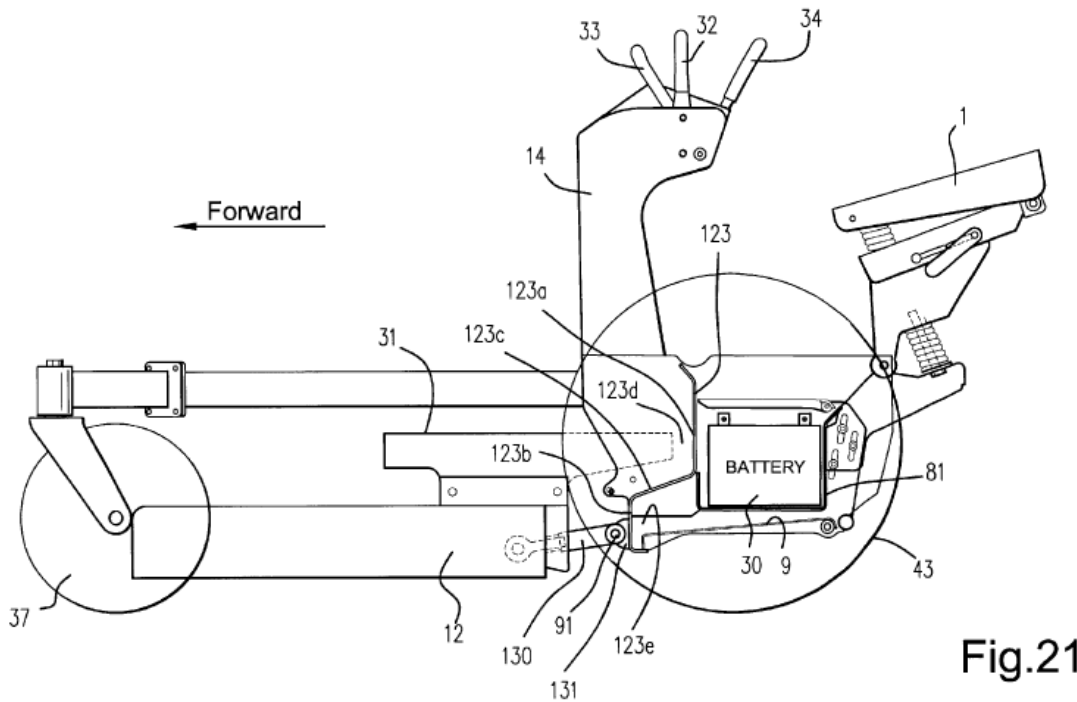
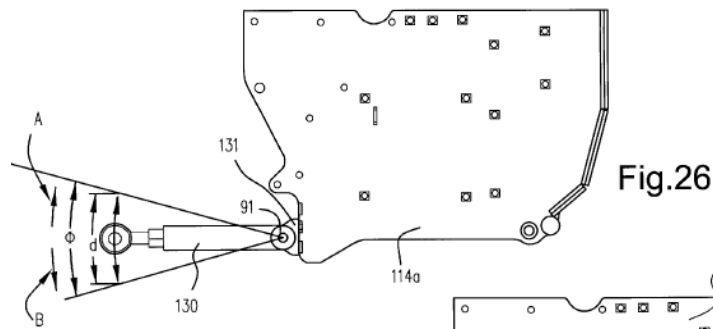
a foot platform for supporting at least one foot of an operator of the mower, said foot platform being located at an elevation less than an elevation of a top edge of at least one of said rear drive wheels;

a deck lift system for raising and lowering a cutter deck assembly, an engine deck, and an engine together as one unit in order to adjust a blade cutting height of the mower;

control arms pivotally attached to at least one of the cutter deck and engine deck in order to provide lateral positioning of the cutter deck assembly and engine deck during the raising and lowering; and

wherein said control arms are short enough in length so that pivoting of the control arms an angle Φ of fifteen (15) degrees either upward or downward during raising or lowering of the cutter deck assembly causes the cutter deck assembly to move a vertical distance "d" no more than about 2.5 inches.

(A103.) Figs. 26 and 21 of the '931 patent are illustrative and set forth below:



(A88, A93.) The claims at issue here, including claim 1 of the '931 patent, relate to a self-propelled power lawn mower. A foot platform 9 is for supporting a standing operator. *Id.* An engine 38 (*e.g.*, labeled in Figs. 1-7) is supported by the engine deck 31. A deck lift system is provided for raising and lowering the cutter deck assembly (*i.e.*, mower deck assembly) 12, the engine deck 31, and the engine 38 *together as one unit* in order to adjust a blade cutting height of the mower.

(*E.g.*, '931 patent at Figs. 21 and 26-27, col. 1:63-67, col. 2:27-33, col. 2:47-50, col. 4:8-14, col. 10:15-30, col. 10:45-54, col. 15:14-18.) Thus, the frame (including 114 and 123) of the mower supports the wheels, and the deck lift system raises/lowers the cutter deck assembly 12, engine deck 31, and engine together as a unit relative to the frame and wheels in order to adjust the cutting height of the mower. (*Id.*; *see also* '931 patent at col. 12:5-45.)

The deck lift system includes control arms 130 that are pivotally attached to at least one of the cutter deck 12 and engine deck 31 in order to provide forward/rearward lateral positioning of the cutter deck assembly and engine deck during the raising and lowering. (*E.g.*, '931 patent at Figs. 21-22 and 26-27, col. 2:51-60, col. 10:46-54, col. 15:10 to col. 16:27.) The other end of each control arm 130 is preferably supported by the tractor frame 114, such as via tabs 131, so that the control arms 130 control positioning of the cutter deck assembly, engine deck and engine as they are raised/lowered relative to the frame and wheels. *Id.* The control arms 130 are specially designed to be short enough in length so that pivoting of the control arms an angle Φ of fifteen (15) degrees either upward or downward during raising or lowering of the cutter deck assembly 12 causes the cutter deck assembly 12 to move a vertical distance "d" no more than about 2.5 inches. (*E.g.*, '931 patent at Fig. 26, col. 2:55-60, col. 15:40-65.)

The proper construction for a “control arm” is an arm that functions to help maintain desired lateral positioning of the cutter deck and engine deck throughout their range of movement when they are raised/lowered. (*E.g.*, ’931 patent at col. 15:22-24 and col. 10:47-49; and A794, A1778-A1779.) This construction of “control arm” is used herein and throughout the ’931 and ’093 patents, and appears to have been used by the PTAB. An arm that does not contribute to maintaining desired lateral positioning (or which arguably does so only in an insignificant tiny way) during raising/lowering of the cutter deck is not a “control arm.” *Id.*

Independent claim 9 of the ’931 patent is similar to claim 1 in many respects (see cites above regarding claim 1). Instead of at least two control arms as in claim 1, claim 9 requires “a control arm” and expressly states that the cutter deck assembly 12 is for “housing” at least one cutting blade. Independent claims 1 and 4 in 95/001,742, involving the ’093 patent, have similar limitations. (A1487-A1490.)

Conventionally, in mowers such as Busboom (A2174-A2189) where the cutter deck assembly moved relative to the engine and engine deck, *long* control arms were required to minimize forward/rearward movement of the cutter deck assembly relative to the engine during raising and lowering in view of the drive belt system provided therebetween. (A828, and ’931 patent at col. 16:8-18.) Contrary to conventional wisdom, the instant inventors found that if one provided

control arm(s) 130 in a deck lift system where the engine 38 and engine deck 31 raised/lowered *together with* the cutter deck assembly 12, then the control arm(s) 130 could be significantly shortened to enable numerous advantages to be realized. (*E.g.*, '931 patent at col. 16:18-27, col. 15:67 to col. 16:9.) For example, the shorter distance between control arm(s) 130 pivot points advantageously allows the mower to be more compact and more durable. *Id.* And it was found that the greater forward/rearward lateral movement of the cutter deck 12 relative to the frame 13 during raising/lowering due to the shorter control arm length (as the deck moves up/down in a tighter arc due to a shorter distance between control arm pivot points) is not problematic in this particular type of deck lift system, because the cutter deck 12, engine deck 31 and engine 38 move together. (*E.g.*, '931 patent at col. 16:18-27.) In other words, because the cutter deck, engine deck and engine move together during raising/lowering, the driving belt(s) between the engine and cutter deck assembly do not suffer from too much slackening or tightening even when there is more forward/rearward lateral movement of the cutter deck relative to the frame due to the shorter control arm(s). *Id.* Thus, the inventors found that using shorter control arms 130 in a deck lift system where the cutter deck, engine deck and engine are all raised/lowered together is particularly useful and provides for advantages not previously recognized.

B. The Prior Art.

Base reference Velke '031 discloses a self-propelled lawn mower. (A2190-A2220.) In base reference Velke '031 the cutter deck 1 is rigidly connected to the engine deck 3. (Velke '031 at col. 12:1-9; Figs. 1, 2 and 12.) For example, Figs. 1 and 12 of Velke '031 illustrate that the cutter deck (mower deck) 1 is connected to engine deck 3 by bolts which extend through holes 187. There can be no relative movement between the cutter deck 1, 202 and the engine deck 3 in Velke '031 because they are rigidly connected to each other by bolts extending through holes 187. Moreover, Velke '031 does not include a separate frame. The engine deck 3 in Velke '031 acts as the frame to which the rear wheels are mounted. (Velke '031 at Figs. 1, 3, 10, and 27.) Thus, in Velke '031 there can be no relative movement between the cutter deck (mower deck) 1, 202 and the engine deck 3 which also functions as the frame, because they are rigidly connected to one another via bolts through holes 187. The cutter deck 1 does not need to be stabilized in Velke '031, because it is already structurally connected to the engine deck/frame.

Base reference Wright '138 also discloses a self-propelled lawn mower. (A2137-A2144.) In Wright '138, the “mower deck 9 is mounted on and below frame 11,” and “mower deck 9 is mounted on and connected to both engine deck 13 and frame 11.” (Wright '138 at Figs. 1-2, and col. 4:27-35.) Thus, there is no disclosed movement between the cutter deck (mower deck) 9, engine deck 13,

engine 7 and frame 11 in Wright '138 because they are mounted on and connected to each other as shown in the drawings and as explained in the specification. The cutter deck (mower deck) 9 does not need to be stabilized in Wright '138, because it is already structurally connected to the engine deck and frame. Like Velke '031, Wright '138 has no control arms and no deck lift system in any way related to the claimed invention at issue here.

Cox discloses a lawn mower where the cutting blade is raised/lowered together with frame 24 and engine 29. (A334-A345.) Cox at page 4 teaches that the frame 24 raises/lowers *together* with the blade and engine 29 as a single unit. (A337.) Thus, there is no disclosure in Cox of any uncontrolled movement of any alleged cutter deck assembly relative to the frame or engine, and there is no suggestion that anything needs to be stabilized. There is no suspension of a cutting assembly by chains in Cox, and the cutting assembly does not need to be stabilized because it moves together with the frame 24.

Musgrave discloses a lawn mower where the cutter deck is raised/lowered together with the engine 21 relative to the frame. (A2128-2136.) Again, there is no suspension of a cutting assembly by chains or any other loose structure in Musgrave. Musgrave has no such chains, and would have never used such chains because the cutter deck assembly 50 in Musgrave is already attached to the frame 11 via plate 16 and bolts 12 in slots 13. (Musgrave at Fig. 1; Fig. 6; col. 3:30-32;

col. 4:59-67 [A2128, A2132, A2134].) Bolts 12 in slots 13 control the position of the cutting assembly during raising/lowering in Musgrave, so that there is no uncontrolled movement of the cutting assembly. The cutting assembly does not need to be stabilized in Musgrave because it is already connected to the frame 11 via bolts 12, and its position during raising/lowering is already controlled and stabilized via bolts 12 in slots 13.

Busboom '033 discloses a lawn mower where the cutter deck (mower deck) 28 is suspended by loose chains 42 from the frame, and where the cutter deck 28 is raised/lowered relative to frame. (A2174-A2181.) Busboom's height-of-cut (HOC) adjustment mechanism includes a control arm 40 that is pivotally connected between the frame and the cutter deck (mower deck) 28 in order to stabilize/control relative movement therebetween during raising/lowering of the cutter deck. (A2177-A2178, A30, A63.) Absent the control arm 40 in Busboom, the position of the cutter deck 28 would be unstable and susceptible to uncontrolled dangling below the frame. Because the cutter deck 28 is suspended from the frame via chains in Busboom, control arm 40 is needed to stabilize the position of the cutter deck 28 during mower operation and during raising/lowering of the cutter deck. *Id.* In mowers such as Busboom where the cutter deck 28 moves relative to the frame, engine and engine deck, a long control arm 40 is needed to minimize forward/rearward movement of the cutter deck 28 relative to the engine during

raising and lowering in view of the drive belt system provided therebetween.

(A828, and '931 patent at col. 16:8-18.)

Accordingly, in Velke '031 as allegedly modified by Cox and Musgrave, and in Wright '138 as allegedly modified by Cox and Musgrave, the cutter deck (mower deck) is already structurally connected to the frame and does not need to be stabilized or controlled. One of ordinary skill in the art would not have modified Velke '031 or Wright '138 as allegedly modified by Cox/Musgrave by adding Busboom's HOC adjustment mechanism (including stabilizing rod [control arm] 40) thereto because there is no uncontrolled cutter deck movement (or any other kind of movement) to stabilize or control. The control arm 40 of Busboom would have served no function or purpose. Therefore, the alleged modification of adding Busboom's control arm and other HOC adjustment mechanism structures to Velke '031 or Wright '138 as allegedly modified by Cox/Musgrave would not have served any purpose, would not have yielded any predictable result, and would have been inoperative.

IV. SUMMARY OF ARGUMENT

It would not have been obvious under 35 U.S.C. § 103 to have modified a base reference where the added feature would serve no purpose or function in the base reference as allegedly modified and would be inoperative. As a matter of common sense and plainly evident from the prior art drawings, Busboom's HOC

adjustment mechanism including the control arm would serve no purpose or function, and would be operative, in the base reference (Velke '031 or Wright '138) as allegedly modified by Cox/Musgrave because in the base reference as allegedly modified the cutter deck and engine deck/frame would have no uncontrolled movement therebetween and there would be no need or logical reason for Busboom's control arm.

There can be no rational or logical reason for the alleged combination when the added feature (including Busboom's control arm) would serve no purpose or function, and would be inoperative, in the alleged combination. The USPTO has not met its burden of establishing a *prima facie* case of obviousness by a preponderance of the evidence.

V. ARGUMENT

A. Standard of Review

“Obviousness is a question of law that [this Court] review[s] *de novo* with underlying factual findings.” *In re NTP, Inc.*, 654 F.3d 1279, 1297 (Fed. Cir. 2011); *see also In re ICON Health & Fitness, Inc.*, 496 F.3d 1374, 1378 (Fed. Cir. 2007) (“Although based on determinations of underlying facts, which we review for substantial evidence, the ultimate conclusion of obviousness is a legal question, which we review *de novo*.”).

B. It Would Not Have Been Obvious to Modify Base Reference Velke '031 as Allegedly Modified by Cox/Musgrave by Adding Busboom's Height-of-Cut (HOC) Adjustment Mechanism Thereto Because it Would Serve No Purpose and Be Inoperative.

Wright first addresses the PTAB's obviousness allegations where the base reference is Velke '031, because the PTAB addressed this first in the decisions on rehearing and because the drawings of Velke '031 contain more detail than do the drawings of the other base reference Wright '138. Wright's arguments regarding the Velke '031 based rejections and the Wright '138 based rejections are similar, and the arguments regarding the Velke '031 based rejections also apply to the Wright '138 based rejections.

The USPTO ruled that original claims 1-3, 7, 9-11 and 13 of the '931 patent in 95/001,741, and claims 1, 3, 4 and 6-17 in 95/001,742, were obvious under 35 U.S.C. § 103 over at least Velke '031 (A2190-A2220) in view of Cox (A334-A345), Musgrave (A2128-A2136), Busboom '033 (A2174-A2181), Hale '536 (A2112-A2118), and Hale '798 (A2119-A2127). This was Rejection 9 in 95/001,741 and Rejection 6 in 95/001,742. (A1-A66.) These obviousness rulings/rejections are erroneous.

A cornerstone of the PTAB's obviousness rulings is the allegation that it would have been obvious to have modified the base reference Velke '031 by adding thereto Busboom's Height-of-Cut (HOC) adjustment mechanism. (A28-A30, A12-A16, A45-A49, A61-A63.) According to the PTAB, Busboom's "HOC

adjustment mechanism” is made up of “bell cranks 82, 104, and 76, 86, deck suspension chains 42, counterbalance springs 96, adjustment handle 54, height control pin 106, and control arms 40 pivotally connected to the mower deck (Figure 3).” (A12-A13, A45-A46.) Thus the PTAB contends that it would have been obvious to have modified base reference Velke ’031 by adding thereto Busboom’s HOC adjustment mechanism (including Busboom’s control arm 40). Because Velke ’031 has no control arms, the PTAB relies on Busboom’s control arm (there is only one control arm in Busboom) to meet the control arm limitations of the above-identified claims.

However, one of ordinary skill in the art at the time of the invention would NOT have added Busboom’s control arm or HOC adjustment mechanism to base reference Velke ’031 because it would have served no purpose and would have been inoperative.

Wright notes that this modification was already presumably considered by the Examiner during the original prosecution of the ’931 and ’093 patents. Base references Velke ’031 and Wright ’138 were considered by the original examiner. (*E.g.*, ’931 patent at pgs. 1-2; and ’031 patent at pgs. 1-2.) And Busboom ’020 [A2182-A2189] (equivalent to Busboom ’033 [A2174-A2181]) was discussed in the background section of both patents and was also considered by the original examiner. (*E.g.*, ’931 patent, col. 1:22-37.) The original examiner’s apparent

presumption that this modification would not have been obvious is consistent with Wright's points herein.

In base reference Velke '031, the cutter deck 1 is rigidly connected to the engine deck 3. (Velke '031 at col. 12:1-9; Figs. 1, 2 and 12.) For example, Figs. 1 and 12 of Velke '031 illustrate that the cutter deck (mower deck) 1 is connected to engine deck 3 by bolts which extend through holes 187.

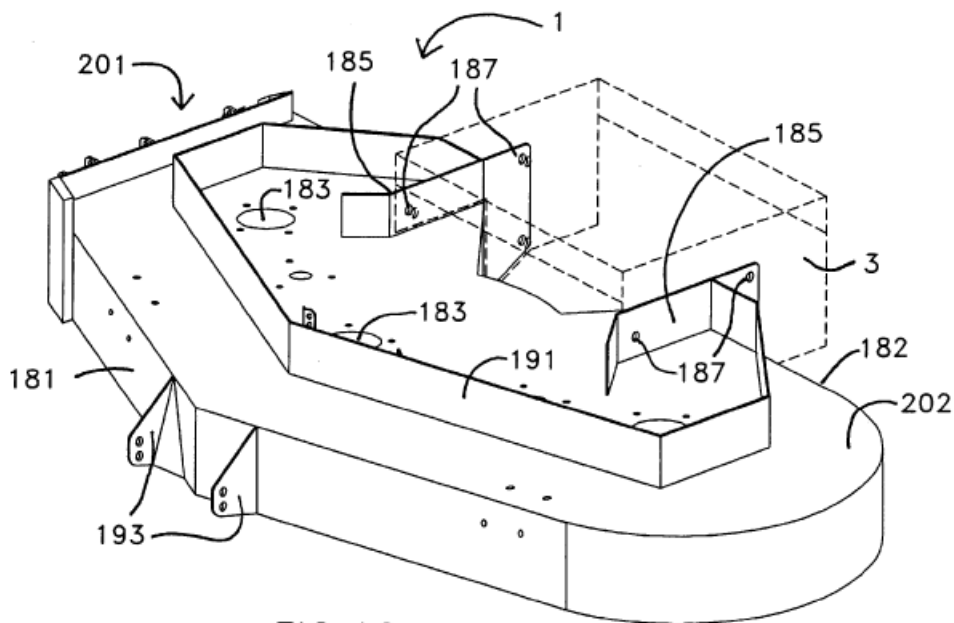


FIG. 12

Thus, *there can be no relative movement* between the cutter deck 1, 202 and the engine deck 3 in Velke '031 because they are rigidly connected to each other by bolts extending through holes 187, and the PTAB did not find otherwise.

Moreover, Velke '031 does not include a separate frame. The engine deck 3 in Velke '031 acts as the frame to which the rear wheels are mounted. (Velke '031 at Figs. 1, 3, 10, and 27.)

As the PTAB acknowledges at A30 and A63, Busboom's control arm 40 is pivotally connected between the frame and the cutter deck (mower deck) so as to control relative movement therebetween. (A30, A63.) However, in Velke '031 there can be no relative movement between the cutter deck (mower deck) 1, 202 and the engine deck 3 which also functions as the frame, because they are rigidly connected to one another via bolts through holes 187.

Therefore, one of ordinary skill in the art would not have modified Velke '031 by adding Busboom's HOC adjustment mechanism (including stabilizing rod [control arm] 40) thereto between Velke '031's cutter deck 1 and engine deck 3 because there is no uncontrolled movement (or any other kind of movement) therebetween to stabilize or control. It is impossible for the cutter deck 1 in Velke '031 to be lifted/lowered relative to the engine deck/frame 3. There is nothing to stabilize in Velke '031 because Velke's cutter deck 1 is already connected to the engine deck/frame 3 and stabilized. Therefore, the alleged modification of adding Busboom's control arm and other HOC adjustment mechanism structures to Velke '031 would not have served any purpose and would not have yielded any predictable result. There is no disclosure in Velke '031 of any uncontrolled lateral movement of the cutter deck assembly (and there could be none), or of any need for anything to be stabilized. One having common sense would not have provided a component [e.g., control arm] to address a problem that did not exist or was

already solved. It simply would make no sense to add a control arm to Velke '031 between the engine deck/frame and cutter deck which are already rigidly connected to each other and cannot move relative to one another.

Busboom '033 provides control arm (“stabilizer rod”) 40 for stabilizing a mower deck 28 that is hanging loosely from a frame via chains 42. (Busboom '033, col. 3:2-7). A long control arm is needed in Busboom where the cutter deck assembly moves up/down *relative to* the engine deck and frame, because it is necessary in Busboom to minimize the movement of the cutter deck assembly relative to the engine and frame during raising/lowering in view of the belt drive system therebetween. (*E.g.*, '931 patent at col. 16:9-22; and Wright Decl., ¶7 [A827-A828, A1795-A1796].) Velke '031 has no such chains and no loosely hanging cutter deck, and would have never used such chains or control arms because the cutter deck 1 in Velke '031 is already rigidly connected to engine deck/frame 3. (Velke '031 at col. 12:1-9; Figs. 1, 2, 12). Accordingly, because there are no loose chains in Velke, and the cutter deck is rigidly connected to the engine deck/frame, there is no need to “stabilize” anything in Velke '031. There would have been no logical reason to have provided any control arm 40, chains or other linkage from Busboom in Velke '031 – it would serve no purpose.

“Stabilizing” a loose chain-suspended mower deck 28 in Busboom is not relevant to Velke '031 because Velke '031 has no such problem. In this respect, one of

ordinary skill in the art would not have added Busboom's lift parts including arm 40 to Velke '031, because in Velke '031 the cutter deck 1 is rigidly connected to the engine deck/frame and could not be raised/lowered relative thereto.

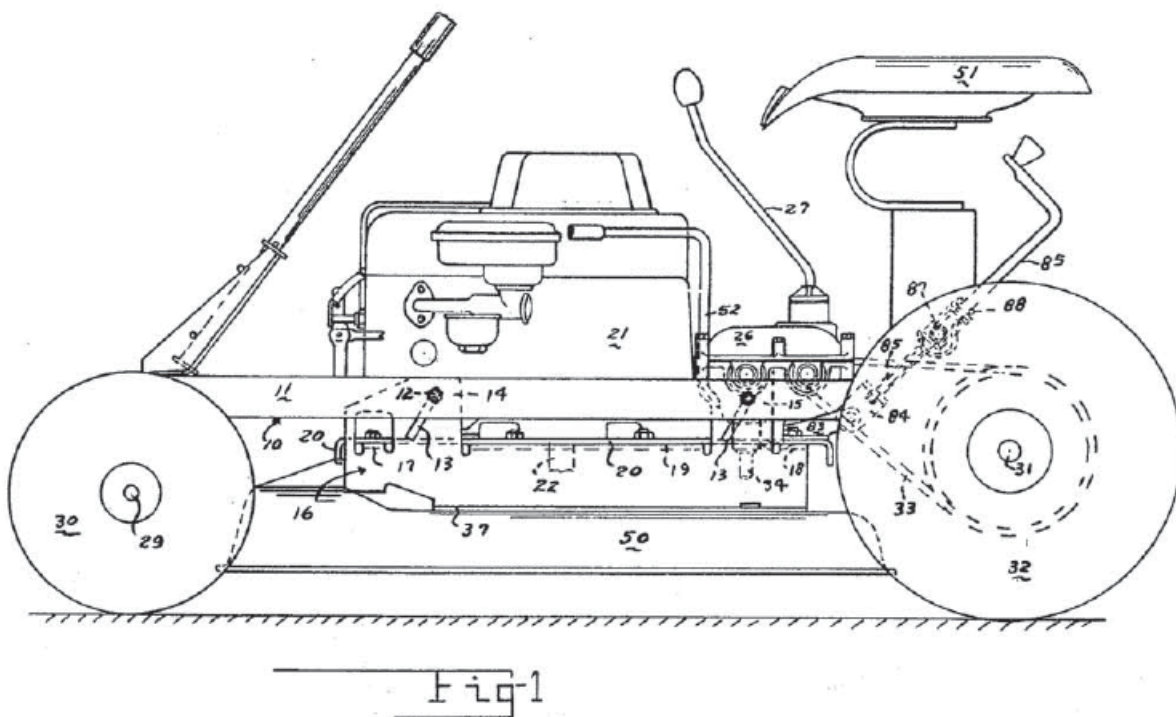
Velke '031 already has a system for adjusting HOC. (Velke '031, col. 11:52-58 and Fig. 10). The HOC adjustment system in Velke '031 involves holes 169 in the frame that enable the wheel positions and thus the height-of-cut to be vertically adjusted. *Id.* The HOC system in Velke '031 is entirely different than that of Busboom, because in Velke '031 the cutter deck is rigidly connected to the engine deck/frame. Therefore, the HOC system in Velke '031 has no chains or control arms. This is NOT a case where only a limited number of deck lift systems were available at the time of the invention, and the PTAB made no such finding. If one were to replace the HOC system in Velke '031 with another HOC system, one of ordinary skill in the art at the time of the invention would have chosen one (from the hundreds or thousands of possible HOC systems available at the time) that would have worked in the mower of Velke '031 where the cutter deck and engine deck/frame are connected – not one such as Busboom's that would serve no function and could not work in Velke '031.

The PTAB affirmed the reexamination examiner's obviousness finding that it would have been obvious to have modified Velke '031 so that the cutter deck moved up/down along with the engine deck and engine as in Cox (A334-A345) and

Musgrave (A2128-A2136). (A7-A8, A13-A14, A702, A714-715, A41, A46, A1706, A1718-A1719.) Thus, it is actually Velke '031 as modified by Cox and Musgrave to which Busboom's HOC adjustment mechanism is allegedly added. This is important, because it makes Wright's point that Busboom's HOC adjustment mechanism would be inoperable and serve no purpose if Velke '031 were modified so that the cutter deck and engine deck moved up/down together as a unit as in Cox or Musgrave as alleged by the PTAB and the reexamination examiner.

The PTAB and reexamination examiner relied on Cox for a structure where *the cutting blade is raised/lowered together with frame 24 and engine 29* (entirely unlike Busboom '033). Cox at page 4 teaches that the frame 24 raises/lowers together with the blade and engine 29 as a single unit. (A337.) Thus, there is no disclosure in Cox of any uncontrolled movement of any alleged cutter deck assembly relative to the frame or engine, and there is no suggestion that anything needs to be stabilized. Again, unlike Busboom, there is no suspension by loose chains in Cox and the cutting assembly does not need to be stabilized because it moves together with the frame 24 and is already connected thereto. Thus, there is no apparent problem with Cox, and there would have been no logical reason to have added Busboom's control arm 40 to Cox (or Velke/Cox) because there is nothing that needs to be stabilized.

The PTAB and reexamination examiner similarly relied on Musgrave for a structure where the cutter deck is raised/lowered together with the engine 21. Similar to Cox, Musgrave also does not describe any structure or problem to be solved that would have led one to have used Busboom's control arm 40 or HOC adjustment mechanism. Again, there is no suspension by loose chains in Musgrave. Musgrave has no such chains, and would have never used such chains because the cutter deck assembly 50 in Musgrave is already attached to the frame 11 via plate 16 and bolts 12 in slots 13. (Musgrave at Fig. 1; Fig. 6; col. 3:30-32; col. 4:59-67 [A2128, A2132, A2134].) Fig. 1 of Musgrave is illustrative:



(A2128.) Bolts 12 in slots 13 control the lateral location of the cutting assembly during raising/lowering in Musgrave, so that there is no uncontrolled movement

and so that there is nothing that needs to be stabilized. *Id.* Again, there would have been no logical reason to have added Busboom's control arm 40 to Velke '031 as allegedly modified by Musgrave. One would not have added a control arm to Velke '031/Musgrave or Velke '031/Cox to address an alleged problem that did not exist or was already solved.

Accordingly, one of ordinary skill in the art at the time of the invention would never have attempted to add Busboom's HOC adjustment mechanism (including alleged control arm 40) to Velke '031 as allegedly modified by Cox or Musgrave, because the control arm would have served no purpose and would have been inoperative.

The control arm of Busboom's HOC adjustment mechanism would have been *inoperative* (would not work) in Velke '031 as allegedly modified, for the reasons explained above. (A947-A948, A1034, A1925-A1926.) The PTAB's failure to even address the inoperability of Busboom's HOC adjustment mechanism in base reference Velke '031 as allegedly modified is telling. As explained above, Busboom's HOC adjustment mechanism requires the cutter deck to be hanging loosely from the frame and/or engine deck to provide for relative movement therebetween that the control arm stabilizes. In contrast, in base reference Velke '031 as allegedly modified by Cox, the cutter deck and engine deck/frame are rigidly connected and cannot move relative to one another. And in

base reference Velke '031 as allegedly modified by Musgrave, movement of the cutting assembly relative to the frame is already controlled and stabilized by bolts 12 in slots 13. Thus, the control arm 40 of Busboom's HOC adjustment mechanism could not work and would serve no purpose. As explained by this Court:

“If references taken in combination would produce a ‘seemingly inoperative device,’ we have held that such references teach away from the combination and thus cannot serve as predicates for a prima facie case of obviousness. *In re Sponnoble*, 405 F.2d 578, 587, 160 USPQ 237, 244, 56 C.C.P.A. 823 (1969) (references teach away from combination if combination produces seemingly inoperative device); *see also In re Gordon*, 733 F.2d 900, 902, 2221 USPQ 1125, 1127 (Fed. Cir. 1984) (inoperable modification teaches away).”

McGinley v. Franklin Sports, Inc., 262 F.3d 1339, 1354 (Fed. Cir. 2001). When the prior art teaches away from the alleged combination, which is the case here given that the control arm of Busboom's HOC adjustment mechanism would serve no function/purpose and be inoperative in the alleged combination, the invention “is more likely to be nonobvious.” *KSR Intern. Co. v. Teleflex Inc.*, 550 U.S. 398, 416, 127 S. Ct. 1727, 1740 (2007). The control arm of Busboom's HOC adjustment mechanism would serve no function and be inoperative in the alleged combination, and thus cannot be said to perform the same function that it performed in Busboom. *Id.* at 416-17.

The PTAB never found that the control arm of Busboom's HOC adjustment mechanism would serve any purpose or be operable in the base reference Velke '031 as allegedly modified by Cox/Musgrave, and never provided any explanation or finding regarding how operability of Busboom's HOC adjustment mechanism in Velke '031 as allegedly modified could possibly occur. This is legal error. As explained herein and as a matter of common sense, Busboom's HOC adjustment mechanism including control arm 40 could not work in Velke '031 as allegedly modified because the cutter deck and engine deck/frame cannot have any uncontrolled movement therebetween in Velke '031 as allegedly modified. The inoperability of Busboom's HOC adjustment mechanism in the base reference as allegedly modified demonstrates that no *prima facie* case of obviousness has been made, and that the cited art instead teaches away from the claimed invention. The claims would not have been obvious to one of ordinary skill in the art at the time of the invention.

The USPTO has the burden under 35 U.S.C. § 103 of establishing a *prima facie* case of obviousness. *In re Piasecki*, 745 F.2d 1468 (Fed. Cir. 1984). It has not done so here. Given that at least the control arm of HOC adjustment system of Busboom would have served no function or purpose in the base reference as allegedly modified, and would have been inoperable, there can be no *prima facie* case of obviousness. By definition, there can be no logical or rational reason for an

alleged combination where the added feature (Busboom's HOC adjustment mechanism including the control arm) would serve no purpose or function, and would be inoperative, in the base reference as allegedly modified. In order to support a finding of obviousness, there must be an "apparent reason" or "rational underpinning" for the alleged combination – there is none here given that the control arm of Busboom's HOC adjustment mechanism would serve no function and be inoperative in the alleged combination. *KSR*, 550 U.S. at 418, 127 S. Ct. at 1741. Hindsight, using the specifications of the '931 and '093 patents as a blueprint to concoct illogical combinations, is not permissible. *Ecolocem, Inc. v. Southern California Edison Co.*, 227 F.3d 1361, 1371-72 (Fed. Cir. 2000).

C. It Would Not Have Been Obvious to Modify Base Reference Wright '138 as Allegedly Modified by Cox/Musgrave by Adding Busboom's Height-of-Cut (HOC) Adjustment Mechanism Thereto Because it Would Serve No Purpose and Be Inoperative.

Wright's arguments regarding the Wright '138 based rejections are the same as those explained above in Section B regarding the Velke '031 based rejections (incorporated into this section by reference), except that Wright '138 replaces Velke '031 in this section. Wright's arguments regarding the Wright '138 based findings are summarized as follows.

The USPTO ruled that original claims 1-3, 7, 9-11 and 13 of the '931 patent in 95/001,741 and claims 1, 3, 4, 6-14, 16 and 17 in 95/001,742 were obvious under 35 U.S.C. § 103 over at least Wright '138 (A2137-A2144) in view of Cox,

Musgrave, Busboom, Hale '536, and Hale '798. This was Rejection 5 in 95/001,741 and Rejection 4 in 95/001,742. (A1-A66.) These obviousness rulings/rejections are erroneous for at least the reasons explained herein.

A cornerstone of the PTAB's obviousness rulings is the allegation that it would have been obvious to have modified the base reference Wright '138 as allegedly modified by Cox/Musgrave, by adding thereto Busboom's Height-of-Cut (HOC) adjustment mechanism which includes control arm 40. (A28-A30, A12-A16, A45-A49, A61-A63.) However, one of ordinary skill in the art at the time of the invention would NOT have added Busboom's control arm or HOC adjustment mechanism to base reference Wright '138 as allegedly modified because it would have served no purpose and would have been inoperative, for the reason explained above in Section B regarding Velke '031.

In base reference Wright '138, the "mower deck 9 is mounted on and below frame 11," and "mower deck 9 is mounted on and connected to both engine deck 13 and frame 11." (Wright '138 at Figs. 1-2, and col. 4:27-35.) Thus, there is no disclosed movement between the cutter deck (mower deck) 9, engine deck 13, engine 7 and frame 11 in Wright '138 because they are mounted on and connected to each other as shown in the drawings and as explained in the specification. Like Velke '031, Wright '138 has no control arms and no deck lift system in any way related to the claimed invention at issue here. The PTAB cannot change this, and

meet its burden by a preponderance of the evidence, by speculating that there is some small possibility that relative movement could hypothetically occur.

Recognizing this flaw in Wright '138, the PTAB found that it would have been obvious to have modified Wright '138 so that the cutter deck moved up/down along with the engine deck and engine relative to the frame as in Cox (A334-A345) and Musgrave (A2128-A2136). (A7-A8, A12-A14, A702-A703, A41, A45-A47, A1706-A1708.) It is Wright '138 as modified by Cox and Musgrave to which Busboom's HOC adjustment mechanism is allegedly added. However, Busboom's HOC adjustment mechanism, including the control arm, would be inoperable and serve no purpose if Wright '138 were modified so that the cutter deck and engine deck moved up/down together as a unit as in Cox or Musgrave as alleged by the PTAB and reexamination examiner.

The PTAB and reexamination examiner relied on Cox for a structure where the cutting blade is raised/lowered together with frame 24 and engine 29 (entirely unlike Busboom '033). Cox at page 4 teaches that the frame 24 raises/lowers together with the blade and engine 29 as a single unit. (A337.) Thus, there is no disclosure in Cox of any uncontrolled movement of any alleged cutter deck assembly relative to the frame or engine, and there is no suggestion that anything needs to be stabilized. Again, unlike Busboom, there is no suspension by loose chains in Cox (or Wright '138) and the cutting assembly does not need to be

stabilized because it moves together with the frame 24 and is already connected thereto. Thus, there is no apparent problem with Cox, and there would have been no logical reason to have added Busboom's control arm 40 to Cox (or Wright '138/Cox) because there is nothing that needs to be stabilized.

The PTAB and reexamination examiner similarly relied on Musgrave for a structure where the cutter deck is raised/lowered together with the engine 21. Similar to Cox, Musgrave does not describe any structure or problem to be solved that would have led one to have used Busboom's control arm 40 or HOC adjustment mechanism. Again, there is no suspension by loose chains in Musgrave or Wright '138. Musgrave has no such chains, and would have never used such chains because the cutter deck assembly 50 in Musgrave is already attached to the frame 11 via plate 16 and bolts 12 in slots 13. (Musgrave at Fig. 1; Fig. 6; col. 3:30-32; col. 4:59-67 [A2128, A2132, A2134].) Bolts 12 in slots 13 control the lateral location of the cutting assembly during raising/lowering in Musgrave, so that there is no uncontrolled movement and so that there is nothing that needs to be stabilized in Musgrave or Wright '138 as allegedly modified by Musgrave. *Id.* Again, there would have been no logical reason to have added Busboom's control arm 40 to Wright '138 as allegedly modified by Musgrave. One would not have added a control arm to Wright '138/Musgrave or Wright '138/Cox to address an alleged problem that did not exist or was already solved.

Accordingly, one of ordinary skill in the art at the time of the invention would never have attempted to add Busboom's HOC adjustment mechanism (including alleged control arm 40) to Wright '138 as allegedly modified by Cox or Musgrave, because it would have served no purpose and would have been inoperative.

Again, Busboom's HOC adjustment mechanism including the control arm would have been *inoperative* (would not work) in Wright '138 as allegedly modified, for the reasons explained above. (A947-A948, A1034, A1925-A1926.) The PTAB failed to address this. As explained above, Busboom's HOC adjustment mechanism requires the cutter deck to be hanging loosely from the frame and/or engine deck to provide for relative movement therebetween that the control arm stabilizes. In contrast, in base reference Wright '138 as allegedly modified by Cox, the cutter deck and engine deck/frame are rigidly connected and cannot move relative to one another. And in base reference Wright '138 as allegedly modified by Musgrave, movement of the cutting assembly relative to the frame is already controlled and stabilized by bolts 12 in slots 13. Thus, Busboom's HOC adjustment mechanism (including the control arm) could not work and would serve no purpose, evidencing the patentable nature of the claims. *McGinley v. Franklin Sports, Inc.*, 262 F.3d 1339, 1354 (Fed. Cir. 2001).

The PTAB never found that the control arm of Busboom's HOC adjustment mechanism would serve any purpose or be operable in the base reference Wright '138 as allegedly modified by Cox/Musgrave, and never provided any explanation or finding regarding how operability of Busboom's HOC adjustment mechanism in Wright '138 as allegedly modified could possibly occur. As explained herein and as a matter of common sense, Busboom's HOC adjustment mechanism including control arm 40 could not work in Wright '138 as allegedly modified because the cutter deck and engine deck/frame cannot have any uncontrolled movement therebetween in Wright '138 as allegedly modified by Cox/Musgrave. The inoperability of Busboom's HOC adjustment mechanism in the base reference as allegedly modified demonstrates that no *prima facie* case of obviousness has been made, and that the cited art instead teaches away from the claimed invention.

The USPTO has the burden under 35 U.S.C. § 103 of establishing a *prima facie* case of obviousness. It has not done so here. Given that the HOC adjustment system of Busboom would have served no function or purpose in the modified mower, and would have been inoperable, there can be no *prima facie* case of obviousness. There can be no logical or rational reason for an alleged combination where the added feature (Busboom's HOC adjustment mechanism including the control arm) would serve no purpose or function, and would be inoperative, in the base reference as allegedly modified. Hindsight, using the specifications of the

'931 and '093 patents as a blueprint to concoct illogical combinations, is not permissible.

D. All Other PTAB Obviousness Rulings Are Based on the Erroneous Obviousness Rulings Discussed Above and Also Should Be Reversed.

All other obviousness rulings by the PTAB rely on the two above-referenced obviousness findings based on Velke '031 and Wright '138, which are incorrect and should be reversed for the reasons explained herein. Once these two PTAB obviousness rulings/rejections are found to be incorrect, all other obviousness rulings/rejections necessarily fail and should also be reversed for at least the reasons explained herein.

VI. CONCLUSION

For the reasons sets forth above, Wright respectfully requests that this Court reverse the USPTO's decisions. The independent claims would not have been obvious over the cited art.

Respectfully submitted,

September 29, 2014

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ADDENDUM

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JASTRZAB, JEFFREY R

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PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

THE TORO COMPANY
Requester, Cross-Appellant, Respondent

v.

WRIGHT MANUFACTURING, INC.
Patent Owner, Appellant, Respondent

Appeal 2013-002864
Inter partes Reexamination Control 95/001,741
Patent US 6,438,931 B1¹
Technology Center 3900

Before RICHARD M. LEBOVITZ, JEFFREY B. ROBERTSON and
DANIEL S. SONG, *Administrative Patent Judges*.

SONG, *Administrative Patent Judge*

DECISION ON APPEAL

¹ Patent US 6,438,931 B1 (hereinafter "'931 patent") issued August 27, 2002, to Velke et al.

Appeal 2013-002864
Reexamination Control 95/001,741
US 6,438,931 B2

STATEMENT OF THE CASE

Claims 1-40 stand rejected and are the subject of the present appeal, claims 15-40 having been added during the reexamination (RAN² PTOL-2066; ABPO 3; CABR 1). The Patent Owner appeals under 35 U.S.C. §§ 134(b) and 315 (2002) from the rejection of claims 1-40 as discussed *infra*. The Requester cross-appeals under 35 U.S.C. §§ 134 and 315 from the Examiner's refusal to enter various proposed rejections of claims 1-7 and 9-14 (CABR 1). We have jurisdiction under 35 U.S.C. §§ 134(b) and 315.

In addition to their respective briefs, the Patent Owner also relies on the declaration of inventor William R. Wright while the Requester also relies on the declaration of Garry Busboom, who is a named inventor of an applied prior art and employee of Exmark Manufacturing Company, Inc., which is a wholly owned subsidiary of the Requester (Resp. Br. R 1). We also note that the '931 patent is involved in the legal action *Wright Manufacturing, Inc. v. The Toro Company and Exmark Manufacturing Company, Inc.*, 11-cv-01373-MJG (D. Maryland) which has been stayed pending the outcome of the present reexamination proceedings (ABPO 2; CABR 1).

² Because the Examiner's Answer mailed September 24, 2012 merely incorporates the Right to Appeal Notice mailed May 2, 2012, we refer to the same in this decision. We also refer to and address only specific portions of the record necessary to the disposition of the appeal, abbreviating the documents as follows:

1. Right of Appeal Notice = RAN
2. Appeal Brief of Patent Owner = ABPO
3. Rebuttal Brief of Patent Owner = Reb. Br. PO
4. Respondent Brief of Patent Owner = Resp. Br. PO
5. Cross-Appeal Brief of Requester = CABR
6. Respondent Brief of Requester = Resp. Br. R

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The application that issued as the '931 patent is the parent of a continuation application which issued as US 6,935,093 and is the subject of Reexamination Control 95/001,742 and Appeal No. 2013-002900 (ABPO 2; CABR 1). A combined oral hearing with the representatives of the Patent Owner and Requester with respect to the present case and the related case was held before the Patent Trial and Appeal Board on May 1, 2013, and a transcript thereof will be entered into the electronic record in due course. The Board's decision with respect to Appeal No. 2013-002900 is mailed concurrently with this decision.

We AFFIRM with respect to the Appeal of the Patent Owner. In addition, because our decision with respect to the Appeal of the Patent Owner maintains the rejections of all of the claims, we do not reach the Requester's Cross-Appeal.³

³ In presenting the Requester's cross-appeal during the Oral Hearing, the Requester's representative Mr. Miller stated:

MR. MILLER: ...

Well, with that, we think that if you tipped -- you know, this whole set of rejections that are at issue in the cross-appeal are moot in a sense, if the basic set of rejections is maintained. They were proposed because in the inter partes reexamination due to the estoppel effect, you need to make the arguments.

I think they are good rejections, should the first set of rejections be, for some reason, not upheld, but like I said, I think they are moot in the event the main set of rejections would be upheld.

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THE INVENTION

The '931 patent describes a mower and representative independent claim 9 reads as follows (ABPO, Claims App'x, emphasis added):

9. A power mower comprising:
at least one drive wheel;
an engine deck structure upon which an engine is mounted;
a cutter deck assembly for housing one or more cutting blades for cutting grass;
a deck lift system for raising and lowering the cutter deck assembly, the engine deck, and the engine together as a unit in order to adjust a blade cutting height of the mower; and
wherein *a control arm, for helping provide lateral positioning of the cutter deck assembly during the raising and lowering, is short enough in length so that pivoting of the control arm an angle ϕ of fifteen (15) degrees during raising or lowering of the cutter deck assembly causes the cutter deck assembly to move a vertical distance "d" of no more than about 2.5 inches.*

Independent claim 1 is similar to claim 9, but further specifies "zero radius turn[]" capability and requires control arms be attached to one of the cutter deck and the engine deck.

PRIOR ART

The prior art in the appeal record is:

Wright	5,507,138	Apr. 16, 1996
Musgrave	3,460,325	Aug. 12, 1969
Busboom	5,816,033	Oct. 6, 1998
Hale	3,402,536	Sep. 24, 1968
Hale	3,408,798	Nov. 5, 1968
Velke	5,809,755	Sep. 22, 1998
Velke	5,984,031	Nov. 16, 1999

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Berrios	5,653,466	Aug. 5, 1997
Cox	Australia 271377	Nov. 18, 1965
Exmark Manufacturing Company, Inc., " <i>Lazer Z Brochure</i> ", 1995		

FINDINGS OF FACT

The record supports the following findings of fact (FF) by a preponderance of the evidence.

1. A. Wright discloses a zero turn radius mower wherein the "[m]ower deck 9 is mounted on and below frame 11 in front of engine 7 and engine deck 13[.]" and further discloses that "mower deck 9 is mounted on and connected to both engine deck 13 and frame 11" (col. 4, ll. 27-34; Fig. 2).
B. However, Wright does not disclose the manner in which the mower deck is mounted/connected to the frame and engine deck, or require that the mower deck be fixed in position relative to the engine deck so as to preclude relative movement therebetween.
C. Wright also states that "[m]ower deck 9 (or alternatively the mower wheels) is vertically movable or adjustable so as to adjust the height of the cut." (Col. 4, ll. 36-39).
D. However, Wright does not specifically disclose the details of the height of cut adjustment mechanism.
2. A. Busboom discloses a zero turn radius mower including a mower deck height control for adjusting the height of cut (Abst.; Figs. 1, 3, 4).

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B. The mower 10 of Busboom includes a frame means 12, an engine support deck 18, an engine 20 and a mower deck 28 (col. 2, ll. 52-60; col. 2, l. 66-col. 3, l. 1; Figs. 1, 3).

C. Busboom discloses that the mower deck is supported by a plurality of chain members 42 which are connected to a mower deck height control mechanism 44 that enables the mower deck to be raised or lowered with respect to the frame 12 (col. 3, ll. 4-9; Figs. 1, 3).

D. Busboom teaches that the deck height control mechanism 44 further includes lift arms 82, 76 to which the chain members 42 are secured, and is operated by actuation of a control lever 54 (col. 3, ll. 20-32; col. 3, ll. 45-49; Fig. 4).

E. Busboom also teaches that the mower 10 includes a stabilizer rod 40 that connects mower deck 28 to frame 12 "in conventional fashion." (Col. 3, ll. 2-4; Fig. 3).

3. A. Cox discloses a mower with an adjustable frame 24, an engine mounted to the adjustable frame 24, and a rotor disc 31 with blades 32 (pg. 4, ll. 5-18; Figs. 1, 2).

B. Cox teaches that the height of cut is adjusted by raising and lowering the adjustable frame 24 via height adjustment lever 33 which changes the height of the rotor and blades (pg. 4, ll. 19-22; Figs. 1, 2). Thus, the engine mounted on the adjustable frame 24 is also raised and lowered.

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4. A. Musgrave discloses a mower including a motor 21 mounted on plate 20 and a mower deck 50 mounted to plate extensions 37 of plate 16 with slots 13 (col. 2, ll. 17-26, 38-44; col. 3, ll. 25-28; col. 4, ll. 55-61; Figs. 1, 2).

B. Musgrave teaches that the vertical height adjustment is attained by raising or lowering the entire connected structure including the motor, plate 20 and mower deck 50 (col. 4, ll. 55-63; Figs. 1, 2).

5. Hale '536 discloses a vehicle 20 with a mower unit 36 which is connected to linkage members 136 (i.e., control arms) to rear axle 26 (col. 2, ll. 25-37; col. 4, ll. 53-66).

6. Hale '798 discloses a mower with a circular mower frame 94 (i.e., mower deck) which is connected to control arms 86, 87 that are connected to a support bar 83 (col. 4, l. 68-col. 5, l. 12; Figs. 1, 2, 6).

7. A. Velke '031 discloses a zero-turning radius mower with a cutter deck 1, an engine 9 mounted on an engine deck 3 and a standing platform 18 (col. 5, ll. 13-16, 32-46; Figs. 1, 2).

B. Velke '031 states that "the mower and cutter decks are separate structures for performing different functions" (col. 5, ll. 32-33), and that the cutting deck 1 is mounted to the engine deck 3 (col. 11, l. 66-col. 12, l. 2).

C. In the mower of Velke '031, the height of cut adjustment is disclosed as being achieved by adjusting the mounting position of

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the wheel motor brackets 157 for the rear drive wheels 7 along numerous mounting holes 169 provided, together with adjusting the vertical position of the front caster wheels 5 (col. 5, ll. 32-46; col. 11, ll. 52-58; Figs. 1, 3, 10).

PRINCIPLES OF LAW

In *KSR*, the Supreme Court reaffirmed principles based on its precedent that "[t]he combination of familiar elements according to known methods is likely to be obvious when it does no more than yield predictable results." *KSR Int'l Co. v. Teleflex Inc.*, 550 U.S. 398, 416 (2007). The Court also stated that "when a patent claims a structure already known in the prior art that is altered by the mere substitution of one element for another known in the field, the combination must do more than yield a predictable result." *Id.* The Court also explained that "[w]hen a work is available in one field of endeavor, design incentives and other market forces can prompt variations of it, either in the same field or a different one. If a person of ordinary skill can implement a predictable variation, §103 likely bars its patentability." *Id.* at 417. The Court further noted that "[a] person of ordinary skill is also a person of ordinary creativity, not an automaton." *Id.* at 421.

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EXAMINER'S REJECTIONS

The Examiner rejects the following claims of the '741 patent under 35 U.S.C. § 103(a) as obvious over the cited prior art references:⁴

5. Claims 1-3, 7, 9-11 and 13 over Wright in view of Cox, Musgrave, Busboom, Hale '536 and Hale '798.
6. Claims 4-6 and 12 over Wright, Cox, Musgrave, Busboom, Hale '536 and Hale '798 in view of Lazer Z.
7. Claim 8 over Wright, Cox, Musgrave, Busboom, Hale '536 and Hale '798 in view of Velke '755.
8. Claim 14 over Wright, Cox, Musgrave, Busboom, Hale '536 and Hale '798 in view of Berrios.
9. Claims 1-3, 7, 9-11 and 13 over Velke '031 in view of Cox, Musgrave, Busboom, Hale '536 and Hale '798.
10. Claims 4-6 and 12 over Velke '031, Cox, Musgrave, Busboom, Hale '536 and Hale '798 in view of Lazer Z.
11. Claim 8 over Velke '031, Cox, Musgrave, Busboom, Hale '536 and Hale '798 in view of Velke '755.
12. Claim 14 over Velke '031, Cox, Musgrave, Busboom, Hale '536 and Hale '798 in view of Berrios.
14. Claims 1-3, 7, 9-11, 13 and 14 over Cox in view of Busboom, Hale '536 and Hale '798.
15. Claims 4-6 and 12 over Cox, Busboom, Hale '536 and Hale '798 in view of Lazer Z.

⁴ For clarity, the following enumerated Rejections utilize numbering that corresponds to the numbering of the "Issues" used by the Patent Owner in its briefs and by the Examiner in the RAN.

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16. Claims 1-3, 7, 9-11, 13 and 14 over Musgrave in view of Busboom, Hale '536 and Hale '798.

17. Claims 4-6 and 12 over Musgrave, Busboom, Hale '536 and Hale '798 in view of Lazer Z.

26. Claims 15-20, 22-23, 30-31, 33, 35 and 37-40 over Wright in view of Cox, Musgrave, Busboom, Hale '536 and Hale '798.

27. Claims 28-29 over Wright, Cox, Musgrave, Busboom, Hale '536, Hale '798 and Velke '755.

28. Claim 34 over Wright, Cox, Musgrave, Busboom, Hale '536, Hale '798 and Velke '031 or Berrios.

29. Claims 15-20, 22-23, 30-31, 33-35 and 37-40 over Velke '031, Cox, Musgrave, Busboom, Hale '536 and Hale '798.

30. Claims 28-29 over Velke '031 in view of Cox, Musgrave, Busboom, Hale '536, Hale '798 and Velke '755.

31. Claims 21, 24-27, 32 and 36 over Wright in view of Cox, Musgrave, Busboom, Hale '536, and Hale '798.

32. Claims 21, 24-27, 32 and 36 over Velke '031 in view of Cox, Musgrave, Busboom, Hale '536, and Hale '798.

ISSUES

The following dispositive issues have been raised in the present appeal:

1. Whether the Examiner erred in concluding that the claims are obvious principally based on the combination of Wright in view of Cox, Musgrave, Busboom, Hale '536 and Hale '798.

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2. Whether the Examiner erred in concluding that the claims are obvious principally based on the combination of Velke '031 in view of Cox, Musgrave, Busboom, Hale '536 and Hale '798.

ANALYSIS

Rejections 5-8, 26-28 and 31

Rejections 5-8, 26-28 and 31 are all based principally on the combination of Wright in view of Cox, Musgrave, Busboom, Hale '536 and Hale '798. Both of the independent claims 1 and 9, as well as claims 2, 3, 7, 10, 11 and 13 that ultimately depend therefrom, stand rejected in Rejection 5 as unpatentable over this combination of prior art (RAN 2-10). The Examiner finds that Wright teaches a zero turn radius mower with a foot platform where the mower deck is "mounted on and connected to" the engine deck and the frame (RAN 2; *see also* FF 1A). However, the Examiner concedes that Wright "fails to teach that vertical adjustment of the mower deck enables movement of both the engine and the mower as one unit and fails to teach the specifics of the vertical deck adjustment mechanism." (RAN 2-3) (i.e., the recited "deck lift system for raising and lowering the cutter deck assembly, the engine deck, and the engine together as a unit in order to adjust a blade cutting height of the mower" of the claims). Indeed, while Wright suggests including a mechanism for adjusting the height of cut (also referred to herein as "HOC"), it does not actually disclose a specific mechanism for doing so (FF 1B-1D).

For the actual HOC adjustment mechanism and the control arm, the Examiner relies Busboom that discloses a mower with "bell cranks 82, 104

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and 76, 86, deck suspension chains 42, counterbalance springs 96, adjustment handle 54, height control pin 106[,] and control arms 40 pivotally connected to the mower deck (Figure 3)." (RAN 3). The Examiner concludes that "[i]t would have been obvious to one having ordinary skill in the art at the time of the invention, given the Wright suggestion of vertical height adjustability to have incorporated the Busboom HOC structures into the mower of Wright '138 as a mere substitution of known mechanisms for making mower decks 'vertically moveable or adjustable.'" (RAN 3; *see also* FF 2A-2E). The Examiner also finds that HOC adjustment in which "the engine moves with the cutting deck were well known in the art at the time of the invention" as evidenced by both Cox and Musgrave (RAN 3; *see also* FF 3A-4B). The Examiner states that given the teachings of Cox and Musgrave, "it would have been obvious to have arranged the modified Wright HOC adjustment to allow for the engine to move in concert with the deck structure as such HOC structures were well established alternatives for allowing an operator to change the cutting height." (RAN 3).

The Examiner concedes that "Wright as modified by Busboom, Cox and Musgrave would not necessarily provide for the claimed control arm length[.]" (RAN 3). However, the Examiner finds that Hale '536 and Hale '798 establish that different length control arms were known in the art and states that "[g]iven these combined teachings, merely adjusting the control arm length in the modified Wright system would have amounted to an obvious choice in engineering design in order to effect a desired range of vertical height adjustment." (RAN 4; *see also* FF 5, 6).

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Thus, the Examiner's position is that it would have been obvious to apply the HOC adjustment mechanism of Busboom including the disclosed chains and control arm to provide stable, vertical adjustability to the deck of Wright wherein the engine moves with cutting deck as known in the art as demonstrated by Cox/Musgrave. The Examiner's position is supported by a preponderance of the evidence. We address the Patent Owner's arguments *infra*.

The Patent Owner argues that even if the prior art references are combined, such combination does not result in the recited angle because the control arm of Busboom is too long (ABPO 11-12; *see also* Decl. of Wright ¶ 6). According to the Patent Owner, Busboom requires a control arm in order to stabilize the mower deck which is suspended by chains, and requires the long length to prevent slackening or tightening of the belt by minimizing fore/aft movement during raising and lowering of the mower deck (ABPO 12-13; *see also* Decl. of Wright, ¶ 7). In contrast, the Patent Owner asserts that in the claimed invention, engine and deck moves together so that slack in the belt is not an issue (ABPO 13). The Patent Owner argues that there is no teaching or suggestion to adjust control arm length or recognition that it is a result effective variable that is to be optimized (ABPO 14). The Patent Owner further argues that both of the Hale references are directed to automatic leveling systems that cannot be implemented in Wright (App. Br. 15-16).

The Patent Owner's arguments are unpersuasive because they do not take into account what the collective teachings of the prior art. *See In re Keller*, 642 F.2d 413, 425 (CCPA 1981) ("The test for obviousness is not

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whether the features of a secondary reference may be bodily incorporated into the structure of the primary reference; nor is it that the claimed invention must be expressly suggested in any one or all of the references. Rather, the test is what the combined teachings of the references would have suggested to those of ordinary skill in the art"). It is not necessary that the inventions of the references must be physically combinable, without change, to render obvious the invention under review. *See In re Sneed*, 710 F.2d 1544, 1550 (Fed. Cir. 1983).

As the Examiner noted, Wright suggests a mechanism for adjusting the height of the mower deck, but fails to disclose the specifics thereof (FF 1C, 1D). Absent such information, one of ordinary skill in the art would have logically considered known HOC adjustment mechanisms to implement in the mower of Wright. Busboom is one such known mechanism. When implementing the HOC adjustment mechanism of Busboom in the mower of Wright, we agree with the Examiner (RAN 4) that it would have been obvious to provide control arms that are sized to be appropriate to the application so that when applied to the compact standing mower of Wright which has a compact frame, the control arms would be shorter than that disclosed in Busboom.⁵ (RAN 5). In this regard, we agree with the Requester that "[t]he logical reason for making the control arms shorter was merely to fit them into the more compact form of mower that

⁵ While not forming the basis of our decision, we also observe that size is not ordinarily a patentable feature. *In re Rose*, 220 F.2d 459, 463 (CCPA 1955) ("size of the article under consideration [] is not ordinarily a matter of invention"); *see also Gardner v. TEC Systems, Inc.*, 725 F.2d 1338, 1346, (Fed. Cir. 1984); *In re Kirke*, 40 F.2d 765, 767 (CCPA 1930).

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Wright had **already** invented and patented '138 - to fit what Owner acknowledges in Wright '138 was the 'reduced overall length ' of the mower." (Resp. Br. R 9). We further agree with the Examiner (RAN 6) that the resultant application of the control arm into the existing compact structure satisfies the recited stabilization function.

The Patent Owner also argues that a person of ordinary skill in the art would not provide Busboom's control arm in the mower of Wright because there is no room and it would require substantial reconstruction and redesign rendering Wright unsuitable for its intended purpose of providing compact stand-on mower (ABPO 18-20). Again, these arguments are unpersuasive because they are based on bodily incorporation and fail to consider the combined teachings of the art and the skill of one of ordinary skill in the art. *See In re Keller*, 642 F.2d at 425; *In re Sneed*, 710 F.2d at 1550. Persuasive evidence has not been provided that implementing Busboo's HOC adjustment mechanism in Wright's mower by appropriately sizing it to fit would have been beyond the skill of those in the art. *KSR*, 550 U.S. at 417.

The Patent Owner contends that Wright has no chains and there is no need to provide a control arm because "the cutter deck 9 in Wright is already structurally connected to engine deck 13 and frame 11." (ABPO 18, 23). The Patent Owner further argues that neither Cox nor Musgrave discloses any uncontrolled lateral movement and "[o]ne would not have added a control arm to Wright/Musgrave or Wright/Cox to address an alleged problem that did not exist or, at worst, was already solved." (ABPO 24-25).

However, as noted above, while Wright suggests a HOC adjustment mechanism, it does not disclose a particular mechanism. Hence, when the

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HOC adjustment mechanism of Busboom which includes chains is implemented in the mower of Wright, a person of ordinary skill in the art would have also provided a stabilizer rod (i.e., a control arm) disclosed in Busboom for stabilization of the mower deck. While the mower of Wright discloses that the "mower deck 9 is mounted on and connected to both engine deck 13 and frame 11" (FF 1A), this does not preclude relative movement between the mower deck and the engine deck (*see* Resp. Br. PO 11-12 (Patent Owner agreeing with the Examiner that the mower deck and the engine deck of Wright can be "mounted on" each other and "connected," but "not necessarily move up/down together as one unit.")⁶; *see also* FF 4A, 4B). Wright also does not teach against the use of a mower deck supported by chains which is well-known in the art and indeed present in the Busboom mower (*see* Busboom, Figs. 3, 4) and not in dispute between the parties. Thus, while the Patent Owner asserts that a control arm may not be necessary in a mower based on the combination of Wright/Musgrave or Wright/Cox, when the mower deck height control mechanism 44 of Busboom with its chains is implemented in the Wright's mower to provide the various functions thereof, a control arm would be desirable to stabilize the mower deck.

The Patent Owner also argues that Wright criticizes sit-down mowers like that of Busboom (ABPO 18-20). However, while Wright may criticize

⁶ In response to questioning regarding relative movement between the engine, the engine deck and the cutting deck in the mower of Wright, the Patent Owner's legal representative Mr. Rhoa also stated:

MR. RHOA: Wright 138, yes. Is it possible that there is some movement there between? Yes, it's possible.

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sit-down mowers because of high centers of gravity and the difficulty of users in ducking under low hanging tree limbs (*see* Wright, col. 1, l. 60-col. 2, l. 6), this teaching does not provide a correlation between the HOC adjustment mechanisms known in the art and the seating position of the user. Thus, the criticism in Wright with respect to seating position would not dissuade one of ordinary skill in the art from implementing the HOC adjustment mechanism that is also taught in Busboom. Furthermore, as noted by the Requester, Wright '138 also "criticizes" many different kinds of mowers which would, according to the Patent Owner's logic, result in the untenable position of removing a substantial body of art pertinent to mowers from consideration (Resp. Br. R 15 and citations therein). Nonetheless, a known or obvious product "does not become patentable simply because it has been described as somewhat inferior to some other product for the same use." *In re Gurley*, 27 F.3d 551, 553 (Fed. Cir. 1994).

Finally, the Patent Owner takes issue with the Examiner's statement that "[g]iven these combined teachings, merely adjusting the control arm length in the modified Wright system would have amounted to an obvious choice in engineering design in order to effect a desired range of vertical height adjustment." (RAN 4). The Patent Owner argues that the "proposed rationale for the alleged shortening of Busboom's control arm length is technically inaccurate and fundamentally flawed" because the length of the control arm in Busboom "does not determine or effect the range of vertical height adjustment of the cutter deck." (ABPO 17, *citing* Decl. of Wright ¶ 8). The Patent Owner argues that "the length of control arm 40 in Busboom

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has nothing to do with determining/effecting the range of vertical height adjustment of the cutter deck." (ABPO 18).

We are not persuaded that the Examiner erred. Firstly, the Patent Owner misstates the Examiner. The Examiner did not say that the control arm "*determine[s]* or effect the range of vertical height adjustment *of the cutter deck*" as asserted by the Patent Owner (emphasis added). Secondly, the Examiner stated that the phrase has been taken "out of context" by the Patent Owner and in view of the apparent misunderstanding, explained that "[c]learly it is not the control arms that control the height adjustment. In the proposed rejection, the control arms allow, thus effect, *the vertical height range that was claimed for the control arms*, but do not actually perform, i.e. directly cause the height adjustment." (RAN 6, emphasis added). In other words, by virtue of their connection to the mower deck, the control arms move as the vertical height of the mower deck is adjusted to result in the vertical height adjustment range *of the control arm* of "no more than about 2.5 inches" as articulated in the claims. Indeed, the paragraph in which the statement at issue occurs sets the context by beginning with the statement that "Wright as modified by Busboom, Cox and Musgrave would not necessarily provide for the claimed control arm length, i.e. that they are short enough such that 15 degree angular movement *corresponds to 2.5 inches of vertical adjustment as claimed*." (RAN 3-4, emphasis added). Thus, we agree with the Examiner that the Patent Owner has taken the statement at issue "out of context," and the Examiner has adequately clarified the statement misunderstood by the Patent Owner.

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Thirdly, the crux of the Examiner's articulated reason for the rejection is that "merely adjusting the control arm length in the modified Wright system would have amounted to an obvious choice in engineering design" based on the evidence of record including Busboom and the Hale references (RAN 3-4). In this regard, the Examiner also stated that:

Those having ordinary skill in the art would have understood that in incorporating the HOC structures of a sitting mower into a more compact standing mower as Wright as suggested in the rejection, that certain aspects would have needed to be adjusted to accommodate the parts... Plainly, those in the art would have understood that moving the Busboom HOC structures to a compact frame would have required shorter control arms, especially when the art was well aware that different frame structures require different length control arms as evidenced by the Hale patents.
(RAN 5).

In addition, the Examiner further stated that:

Those having ordinary skill in the art would have understood that when stabilization was required, control arms can be used as evidenced by any of Busboom or the Hale patents. Clearly it can be gleaned from those teachings that control arms do not have a finite length, but are instead dependent upon the distance between the mower deck and the portion of the frame that the engineer/designer sees fit to establish the requisite degree of stability. When attempting to stabilize in a more compact mower design such as Wright's, it is only reasonable to conclude that those in the art would have understood that shorter control arms would have been required to fit into that more compact system.
(RAN 6-7).

Finally, we highlight the fact that the explanation for the statement at issue was first provided in the Action Closing Prosecution of February 25, 2012, pages 4-6. Thus, the Patent Owner had ample opportunity to respond,

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and the Patent Owner did respond, to the substance of the rejection as discussed above. To the extent that the Patent Owner believes that the clarification changed the ground of rejection as articulated in the Non-Final Office Action, the Patent Owner could have petitioned to have the rejection denominated as a new ground of rejection and prosecution reopened.

As to claim 7, the Patent Owner does not provide any separate arguments as to its patentability. As to claims 2 and 3, the Patent Owner observes that these claims require control arms that are even shorter than that of claim 1, and further notes that claims 9-11 and 13 differ from claim 1 (ABPO 25-26). However, the Patent Owner does not proffer arguments with respect to these claims that substantively differ from those considered.

In view of the above, the Examiner has set forth a *prima facie* case of obviousness with respect to Rejection 5 which was not rebutted by Patent Owner considering the totality of the evidence. We therefore affirm the Examiner. The Patent Owner relies on the same arguments with respect to Rejections 6-8, 26-28 and 31 (ABPO 26-27, 46-47) which are also principally based on the combination of Wright in view of Cox, Musgrave, Busboom, Hale '536 and Hale '798. Thus, we affirm those rejections as well.

Rejections 9-12, 29, 30 and 32

Rejections 9-12, 29, 30 and 32 are all principally based on the combination of Velke '031 in view of Cox, Musgrave, Busboom, Hale '536 and Hale '798. Both of the independent claims 1 and 9, as well as claims 2, 3, 7, 10, 11 and 13 that ultimately depend therefrom, stand rejected in

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Rejection 9 as unpatentable over the combination of Velke '031, Cox, Musgrave, Busboom, Hale '536 and Hale '798 (RAN 14-17).

The Examiner's rejection is substantively similar to Rejection 5 except that prior art reference Velke '031 is substituted for Wright (RAN 17; ABPO 27, 28). In particular, the Examiner finds that Velke '031 teaches a zero turn radius mower with a foot platform wherein height of cut is adjusted by changing the mounting each front caster wheel and wheel/drive motor using mounting holes (FF 7A, 7C). Hence, Velke '031 differs from Wright discussed *supra* in that Velke '031 does disclose an HOC adjustment mechanism. The Examiner concludes that using the HOC adjustment mechanism of Busboom instead of that provided in Velke '031 is a "mere substitution of known mechanisms for making mower decks vertically moveable or adjustable and to incorporate the added bonus of ease of adjustment to Velke ['031]." (RAN 15). As to the provision of a control arm and the length thereof, the disagreement and arguments between the Patent Owner and the Examiner are substantively the same as those discussed *supra* relative to Rejection 5 (RAN 15-RAN 17; ABPO 27-33).

For the reasons substantially similar to those already discussed *supra* relative to Rejection 5, we find no error in the Examiner's rejection. We further add that providing ease of adjustment as articulated by the Examiner is another rational reason for implementing the HOC adjustment mechanism of Busboom that uses a lever, the HOC adjustment in Velke '031 of adjusting each wheel height being cumbersome in comparison (*see* Resp. Br. R 18-19). We further agree with the Examiner that modification of the

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length of the control arm would have been obvious to one of ordinary skill in the art for the reasons already discussed.

Correspondingly, we find that the Examiner has set forth a *prima facie* case of obviousness with respect to Rejection 9 and we sustain the same. The Patent Owner relies on the same arguments with respect to Rejections 10-12, 29, 30, 32 (ABPO 33-34, 47-48) which are also principally based on the combination of Velke '031 in view of Cox, Musgrave, Busboom, Hale '536 and Hale '798. Thus, we affirm those rejections as well.

Rejections 14 and 15

Rejections 14 and 15 are principally based on the combination of Cox in view of Busboom, Hale '536 and Hale '798. However, we decline to reach these rejections, all of the claims on appeal remaining rejected as obvious principally based on the combination of Wright in view of Cox, Musgrave, Busboom, Hale '536 and Hale '798, and also principally based on the combination of Velke '031 in view of Cox, Musgrave, Busboom, Hale '536 and Hale '798.

Rejections 16 and 17

Rejections 16 and 17 are principally based on the combination of Musgrave in view of Busboom, Hale '536 and Hale '798. We again decline to reach Rejections 16 and 17, all of the claims on appeal remaining rejected as obvious principally based on the combination of Wright in view of Cox, Musgrave, Busboom, Hale '536 and Hale '798, and also principally based on

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the combination of Velke '031 in view of Cox, Musgrave, Busboom, Hale '536 and Hale '798.

CONCLUSIONS

1. The Examiner did not err in concluding that the claims are obvious principally based on the combination of Wright in view of Cox, Musgrave, Busboom, Hale '536 and Hale '798, and thus, Rejections 5-8, 26-28 and 31 are AFFIRMED.

2. The Examiner did not err in concluding that the claims are obvious principally based on the combination of Velke '031 in view of Cox, Musgrave, Busboom, Hale '536 and Hale '798, and thus, Rejections 9-12, 29, 30 and 32 are AFFIRMED.

3. We do not reach Rejections 14 and 15.

4. We also do not reach Rejections 16 and 17.

5. We further do not reach the Cross-Appeal of the Requester.

Requests for extensions of time in this *inter partes* reexamination proceeding are governed by 37 C.F.R. §§ 1.956.

AFFIRMED

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EXAMINER

JASTRZAB, JEFFREY R

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PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

THE TORO COMPANY
Requester, Cross-Appellant, Respondent

v.

WRIGHT MANUFACTURING, INC.
Patent Owner, Appellant, Respondent

Appeal 2013-002864
Inter partes Reexamination Control 95/001,741
Patent US 6,438,931 B2
Technology Center 3900

Before RICHARD M. LEBOVITZ, JEFFREY B. ROBERTSON and
DANIEL S. SONG, *Administrative Patent Judges*.

SONG, *Administrative Patent Judge*.

DECISION ON REQUEST FOR REHEARING

The Patent Owner filed PATENT OWNER'S REQUEST FOR REHEARING on July 19, 2013 (hereinafter "Rehearing Request" or "Rhrq. Req.") under 37 C.F.R. § 41.79 seeking rehearing of our Decision mailed June 21, 2013 (hereinafter "Decision" or "Dec.") which affirmed various

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final rejections of the claims made by the Examiner.¹ The Patent Owner asserts that the Board overlooked various facts and requests modification of the Decision.

We grant the Rehearing Request to the extent that we consider the Patent Owner's arguments *infra*, but DENY the request to modify the Decision.

Preliminarily, we observe that the Requester has filed THIRD PARTY REQUESTER'S COMMENTS OPPOSING PATENT OWNER'S REQUEST FOR REHEARING on August 17, 2013 (hereinafter "Requester's Comments" or "Req. Com."). Upon consideration, we agree with the Requester's Comments and cite to portions thereof *infra* as supplemental to our discussion.

Velke '031 in View of Cox, Musgrave, Busboom, Hale '536 and Hale '798

The Patent Owner asserts that the Board overlooked the fact that "in Velke '031 (the base reference) the cutter deck is rigidly connected to the engine deck 3" so that "[t]here can be no relative movement between the cutter deck and the engine deck 3." (Rhrq. Req. 1). Hence, the Patent Owner concludes that "one of ordinary skill in the art would not have modified Velke '031 by adding Busboom's stabilizing rod ... because there

¹ A substantially identical Request for Rehearing has been filed with respect to the Board's decision also mailed June 21, 2013 for Appeal No. 2013-002900 (Reexamination Control 95/001,742 for Patent US 6,935,093). The Board's decision with respect to that Request for Rehearing is being mailed concurrently herewith.

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is no uncontrolled movement [between the cutter deck and the engine deck] to stabilize." (Rhrq. Req. 1; *see also* Rhrq. Req. 2).

The Patent Owner misapprehends the fact that the main rejection based on Velke '031 is not based on merely incorporating Busboom's stabilizer rod into the mower of Velke '031. Rather, the rejection is based on implementing the height-of-cut (hereinafter "HOC") adjustment mechanism of Busboom into the mower of Velke '031 (Dec. 21 *citing* Right of Appeal Notice (hereinafter "RAN") 15-17; *see also* Req. Com. 2-3). As first explained in the Decision with respect to the rejection based principally on Wright '138, the HOC adjustment mechanism of Busboom would include the chain links and the stabilizing rods (Dec. 15-16). The reasons articulated by the Examiner for the combination based on Velke '031 are that: using the HOC adjustment mechanism of Busboom is merely a substitute for changing the mounting of each wheel which is disclosed in Velke '031; and such combination would provide ease of adjusting the HOC as compared to the adjustment disclosed in Velke '031 (Dec. 21; RAN 15-17). We agreed with the Examiner, the reasons articulated being rational and sufficient to support the conclusion of obviousness (Dec. 21-22; *see also* Req. Com. 3).

The Patent Owner argues that Velke '031 "already has a system for adjusting the height-of-cut" so that there would be no reason to replace it with the HOC adjustment mechanism of Busboom (Rhrq. Req. 3). However, as noted *supra* and pointed out in the Decision, the HOC adjustment mechanism of Busboom which uses a lever that is simply grasped by the user and moved to adjust the HOC would make such adjustment easier as compared to the cumbersome method disclosed in

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Velke '031 wherein the height of each wheel must be adjusted separately (Dec. 21).

The Patent Owner further asserts that the stabilizing purpose of Busboom's control arm requires it to be long in order to reduce movement of the cutter deck thereby teaching away from the claims that require short control arms which would reduce the stabilizing function (Rhrq. Req. 3). However, the Patent Owner's assertion is not explained or substantiated by persuasive evidence. Our understanding is that control arms such as those disclosed in Busboom and the subject '248 patent are rigid structural members which are pivotably mounted to the mower deck and the frame. It is not apparent how shortening a control arm so as to be appropriately dimensioned for a smaller mower as set forth in the rejection would reduce the stabilizing function of the control arm.

Wright '138 in View of Cox, Musgrave, Busboom, Hale '536 and Hale '798

The Patent Owner initially asserts that the Board overlooked the fact that "both parties agreed at the Oral Hearing that in Wright '138 (the base reference) the cutter deck 9 is probably rigidly connected to the engine deck 13 so that the cutter deck 9 and engine deck 13 move together as one unit." (Rhrq. Req. 5). The Patent Owner argues that "this agreement as to the content of Wright '138 cannot be ignored" and "[t]he Board's Finding of Fact 1(B) improperly ignores this agreement." (*Id.*). The Patent Owner also argues that Wright '138 does not include chains and the cutter deck is already structurally connected to the engine deck and the frame so that there

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is no need to stabilize anything by adding Busboom's control arm (Rhrgr. Req. 5-6). The Patent Owner's arguments are unpersuasive.

Firstly, facts are established by the evidence, not by mere "agreement" between the parties. Secondly, Finding of Fact 1.B. was that Wright '138 does not disclose the manner in which the mower deck is mounted/connected to the frame and engine deck, or require that the mower deck be fixed in position relative to the engine deck so as to preclude relative movement therebetween. (Dec. 5, FF 1.B.).

In other words, Wright '138 does not disclose sufficient detail to allow a determination that there is no relative movement between the mower deck and the engine deck. The factual finding was neither that Wright '138 discloses relative movement, nor that it discloses no relative movement.

Thirdly, the Patent Owner itself conceded the possibility that the mower deck Wright '138 may be mounted and connected to the engine deck/frame in a manner which allows for relative movement therebetween (Dec. 16 *citing* Resp. Br. PO 11-12; *see also* excerpts from the Oral Hearing set forth in Dec. 16, n.6 and Req. Com. 5).

The conclusion drawn in the Decision was that "while Wright suggests including a mechanism for adjusting the height of cut [], it does not actually disclose a specific mechanism for doing so (FF 1B-1D)." (Dec. 11; *see also* Req. Com. 4-5). The Patent Owner's erroneous assertion regarding the disclosure of Wright '138 notwithstanding, the Patent Owner again misapprehends the basis of the main rejection based on Wright '138 that was affirmed in the Decision by arguing that Wright '138 does not include chains so there is no need for stabilization by adding Busboom's control arm (Rhrgr. Req. 5-6).

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As noted, Wright '138 does not disclose a mechanism for adjusting HOC (Dec. 14; Dec. 5, FF 1B-1D). Hence, we explained,

[a]bsent such information, one of ordinary skill in the art would have logically considered known HOC adjustment mechanisms to implement in the mower of Wright. Busboom is one such known mechanism. When implementing the HOC adjustment mechanism of Busboom in the mower of Wright, we agree with the Examiner (RAN 4) that it would have been obvious to provide control arms that are sized to be appropriate to the application so that when applied to the compact standing mower of Wright which has a compact frame, the control arms would be shorter than that disclosed in Busboom. (RAN 5). (Dec. 14).

Finally, the Patent Owner argues that there are no chains in Cox or Musgrave either so that there is nothing to stabilize (Rhrq. Req. 7). However, the Patent Owner again misses the point that Wright '138 does not disclose a mechanism for HOC adjustment, and that the affirmed rejection is based on using the known HOC adjustment mechanism of Busboom.

REHEARING DECISION

While we have considered the Decision in light of the Request for Rehearing, and have elaborated on certain aspects of the Decision, we decline to modify it in any respect.

DENIED

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ack

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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER

JASTRZAB, JEFFREY R

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PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

THE TORO COMPANY
Requester, Cross-Appellant, Respondent

v.

WRIGHT MANUFACTURING, INC.
Patent Owner, Appellant, Respondent

Appeal 2013-002900
Inter partes Reexamination Control 95/001,742
Patent US 6,935,093 B2¹
Technology Center 3900

Before RICHARD M. LEBOVITZ, JEFFREY B. ROBERTSON and
DANIEL S. SONG, *Administrative Patent Judges*.

SONG, *Administrative Patent Judge*

DECISION ON APPEAL

¹ Patent US 6,935,093 B2 (hereinafter "'093 patent") issued August 30, 2005, to Velke et al.

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STATEMENT OF THE CASE

Claims 1, 3, 4 and 6-17 stand rejected and are the subject of the present appeal. Claims 2 and 5 have been canceled, and claims 7-17 were added during the reexamination (RAN² PTOL-2066; ABPO 3; CABR 1). The Patent Owner appeals under 35 U.S.C. §§ 134(b) and 315 (2002) from the rejection of claims as discussed *infra*. The Requester cross-appeals under 35 U.S.C. §§ 134 and 315 from the Examiner's refusal to enter proposed rejections of claims 1, 3, 4 and 6-17 (CABR 1). We have jurisdiction under 35 U.S.C. §§ 134(b) and 315.

In addition to their respective briefs, the Patent Owner also relies on the declaration of inventor William R. Wright while the Requester also relies on the declaration of Garry Busboom, who is a named inventor of an applied prior art and employee of Exmark Manufacturing Company, Inc., which is a wholly owned subsidiary of the Requester (Resp. Br. R 1). We also note that the '093 patent is involved in the legal action *Wright Manufacturing, Inc. v. The Toro Company and Exmark Manufacturing Company, Inc.*, 11-

² Because the Examiner's Answer mailed September 24, 2012 merely incorporates the Right to Appeal Notice mailed May 2, 2012, we refer to the same in this decision. We also refer to and address only specific portions of the record necessary to the disposition of the appeal, abbreviating the documents as follows:

1. Right of Appeal Notice = RAN
2. Appeal Brief of Patent Owner = ABPO
3. Rebuttal Brief of Patent Owner = Reb. Br. PO
4. Respondent Brief of Patent Owner = Resp. Br. PO
5. Cross-Appeal Brief of Requester = CABR
6. Respondent Brief of Requester = Resp. Br. R

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cv-01373-MJG (D. Maryland) which has been stayed pending the outcome of the present reexamination proceedings (ABPO 2; CABR 1).

The application that issued as the '093 patent is a continuation of an application which issued as US 6,438,931 and is the subject of Reexamination Control 95/001,741 and Appeal No. 2013-002864 (ABPO 2; CABR 1). A combined oral hearing with the representatives of the Patent Owner and Requester with respect to the present case and the related case was held before the Patent Trial and Appeal Board on May 1, 2013, and a transcript thereof will be entered into the electronic record in due course. The Board's decision with respect to Appeal No. 2013-002864 is mailed concurrently with this decision.

We AFFIRM with respect to the Appeal of the Patent Owner. In addition, because our decision with respect to the Appeal of the Patent Owner maintains the rejections of all of the claims, we do not reach the Requester's Cross-Appeal.³

³ In presenting the Requester's cross-appeal during the Oral Hearing, the Requester's representative Mr. Miller stated:

MR. MILLER: ...

Well, with that, we think that if you tipped -- you know, this whole set of rejections that are at issue in the cross-appeal are moot in a sense, if the basic set of rejections is maintained. They were proposed because in the inter partes reexamination due to the estoppel effect, you need to make the arguments.

I think they are good rejections, should the first set of rejections be, for some reason, not upheld, but like I said, I think they are moot in the event the main set of rejections would be upheld.

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THE INVENTION

The '093 patent describes a mower and representative independent claim 1 reads as follows (ABPO, Claims App'x, with underlining showing added subject matter and bracketing showing deleted subject matter relative to the originally issued patent claims, italics added):

1. A self-propelled power lawn mower comprising:
a pair of rear drive wheels;
a cutter deck assembly;
an engine deck assembly supporting a combustion
engine;
a foot platform for supporting a standing operator of the
mower;
a deck lift system for raising and lowering the cutter deck
assembly, engine deck assembly, and combustion engine
together in order to adjust a blade cutting height of the mower;
[and]
first and second pivoting control arms for helping
provide lateral positioning of the cutter deck assembly, engine
deck assembly, and combustion engine during the raising and
lowering, wherein the first and second control arms are
pivotally connected to either the cutter deck assembly or [[an]]
the engine deck assembly, so as to pivot upward and downward
along with corresponding upward and downward movement of
the cutter deck assembly and combustion engine; and wherein
the first and second pivoting control arms are located entirely
forward of both (a) respective rear edges of said rear drive
wheels, and (b) the foot platform for supporting the standing
operator;
wherein at least one of said *control arms pivots about a*
rear pivot axis, said rear pivot axis as viewed in side view being
located (i) forward of said foot platform, (ii) forward of a rear
end of the engine deck assembly, and (iii) rearward of a front
edge of at least one of the rear drive wheels; and
wherein pivoting of the control arms an angle ϕ of fifteen
(15) degrees during raising or lowering of the cutter deck

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assembly and engine causes the cutter deck assembly to move a vertical distance "d" of no more than 2.5 inches.

Independent claim 4 is substantively similar to claim 1.

PRIOR ART

The prior art in the appeal record is:

Hamouz	3,672, 137	June 27, 1972
Wright	5,507,138	Apr. 16, 1996
Musgrave	3,460,325	Aug. 12, 1969
Busboom	5,816,033	Oct. 6, 1998
Hale	3,402,536	Sep. 24, 1968
Hale	3,408,798	Nov. 5, 1968
Velke	5,809,755	Sep. 22, 1998
Velke	5,984,031	Nov. 16, 1999
Berrios	5,653,466	Aug. 5, 1997
Cox	AU 271377	Nov. 18, 1965
Procomas	GB 2 013 073 A	Aug. 9, 1979

FINDINGS OF FACT

The record supports the following findings of fact (FF) by a preponderance of the evidence.

1. A. Wright discloses a zero turn radius mower wherein the "[m]ower deck 9 is mounted on and below frame 11 in front of engine 7 and engine deck 13[.]" and further discloses that "mower deck 9 is mounted on and connected to both engine deck 13 and frame 11" (col. 4, ll. 27-34; Fig. 2).
- B. However, Wright does not disclose the manner in which the mower deck is mounted/connected to the frame and engine deck, or

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require that the mower deck be fixed in position relative to the engine deck so as to preclude relative movement therebetween.

C. Wright also states that "[m]ower deck 9 (or alternatively the mower wheels) is vertically movable or adjustable so as to adjust the height of the cut." (Col. 4, ll. 36-39).

D. However, Wright does not specifically disclose the details of the height of cut adjustment mechanism.

2. A. Busboom discloses a zero turn radius mower including a mower deck height control for adjusting the height of cut (Abst.; Figs. 1, 3, 4).

B. The mower 10 of Busboom includes a frame means 12, an engine support deck 18, an engine 20 and a mower deck 28 (col. 2, ll. 52-60; col. 2, l. 66-col. 3, l. 1; Figs. 1, 3).

C. Busboom discloses that the mower deck is supported by a plurality of chain members 42 which are connected to a mower deck height control mechanism 44 that enables the mower deck to be raised or lowered with respect to the frame 12 (col. 3, ll. 4-9; Figs. 1, 3).

D. Busboom teaches that the deck height control mechanism 44 further includes lift arms 82, 76 to which the chain members 42 are secured, and is operated by actuation of a control lever 54 (col. 3, ll. 20-32; col. 3, ll. 45-49; Fig. 4).

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E. Busboom also teaches that the mower 10 includes a stabilizer rod 40 that connects mower deck 28 to frame 12 "in conventional fashion." (Col. 3, ll. 2-4; Fig. 3).

3. A. Cox discloses a mower with an adjustable frame 24, an engine mounted to the adjustable frame 24, and a rotor disc 31 with blades 32 (pg. 4, ll. 5-18; Figs. 1, 2).

B. Cox teaches that the height of cut is adjusted by raising and lowering the adjustable frame 24 via height adjustment lever 33 which changes the height of the rotor and blades (pg. 4, ll. 19-22; Figs. 1, 2). Thus, the engine mounted on the adjustable frame 24 is also raised and lowered.

4. A. Musgrave discloses a mower including a motor 21 mounted on plate 20 and a mower deck 50 mounted to plate extensions 37 of plate 16 with slots 13 (col. 2, ll. 17-26, 38-44; col. 3, ll. 25-28; col. 4, ll. 55-61; Figs. 1, 2).

B. Musgrave teaches that the vertical height adjustment is attained by raising or lowering the entire connected structure including the motor, plate 20 and mower deck 50 (col. 4, ll. 55-63; Figs. 1, 2).

5. Hale '536 discloses a vehicle 20 with a mower unit 36 which is connected to linkage members 136 (i.e., control arms) to rear axle 26 (col. 2, ll. 25-37; col. 4, ll. 53-66).

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6. Hale '798 discloses a mower with a circular mower frame 94 (i.e., mower deck) which is connected to control arms 86, 87 that are connected to a support bar 83 (col. 4, l. 68-col. 5, l. 12; Figs. 1, 2, 6).

7. A. Velke '031 discloses a zero-turning radius mower with a cutter deck 1, an engine 9 mounted on an engine deck 3 and a standing platform 18 (col. 5, ll. 13-16, 32-46; Figs. 1, 2).

B. Velke '031 states that "the mower and cutter decks are separate structures for performing different functions" (col. 5, ll. 32-33), and that the cutting deck 1 is mounted to the engine deck 3 (col. 11, l. 66-col. 12, l. 2).

C. In the mower of Velke '031, the height of cut adjustment is disclosed as being achieved by adjusting the mounting position of the wheel motor brackets 157 for the rear drive wheels 7 along numerous mounting holes 169 provided, together with adjusting the vertical position of the front caster wheels 5 (col. 5, ll. 32-46; col. 11, ll. 52-58; Figs. 1, 3, 10).

8. A. Velke '755 discloses a zero turn radius mower similar to that of Wright including a mower deck 9 mounted on and below a frame 11 in front of an engine 7 and an engine deck 13 (col. 6, ll. 1-5; Fig. 2).

B. Velke '755 also discloses a platform 71 for supporting the standing operator between the rear drive wheels of the mower (col. 8, ll. 52-60; Figs. 2, 3, 5).

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C. In describing Figure 5, Velke '755 states

the compartment of foot platform 71 undercuts the frame or engine deck 13 according to certain embodiments of this invention. See also FIGS. 2-4. As shown, the foot supporting surface 163 of platform 71 extends forwardly of and underneath of a portion of frame or deck 13 until reaching front or forward wall 159 of the foot platform compartment. Thus, space is saved in that the engine deck, pulley and belt assembly 161, and/or pumps 31, 33 are located vertically above each of the operator's feet and a substantial portion (e.g. at least about 1-3 inches) of the foot platform. This both conserves space is [sic] and functions to protect the operator's feet from flying debris and the like.
(Col. 13, ll. 23-35; Fig. 5).

PRINCIPLES OF LAW

In *KSR*, the Supreme Court reaffirmed principles based on its precedent that "[t]he combination of familiar elements according to known methods is likely to be obvious when it does no more than yield predictable results." *KSR Int'l Co. v. Teleflex Inc.*, 550 U.S. 398, 416 (2007). The Court also stated that "when a patent claims a structure already known in the prior art that is altered by the mere substitution of one element for another known in the field, the combination must do more than yield a predictable result." *Id.* The Court also explained that "[w]hen a work is available in one field of endeavor, design incentives and other market forces can prompt variations of it, either in the same field or a different one. If a person of ordinary skill can implement a predictable variation, §103 likely bars its patentability." *Id.* at 417. The Court further noted that "[a] person of ordinary skill is also a person of ordinary creativity, not an automaton." *Id.* at 421.

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EXAMINER'S REJECTIONS

The Examiner rejects the following claims of the '093 patent under 35 U.S.C. § 103(a) as obvious over the cited prior art references:⁴

4. Claims 1, 3, 4, 6-14, 16 and 17 over Wright in view of Cox, Musgrave, Busboom, Hale '536, Hale '798 and Velke '755. Claim 11 is also alternatively rejected in further view of Procomas and Hamouz.

4A. Claim 15 over Wright, Cox, Musgrave, Busboom, Hale '536, Hale '798 and Velke '755 in view of Velke '031 or Berrios.

6. Claims 1, 3, 4 and 6-17 over Velke '031 in view of Cox, Musgrave, Busboom, Hale '536 and Hale '798, and alternatively in further view of Velke '755. Claim 11 is also alternatively rejected in further view of Procomas and Hamouz.

ISSUES

The following dispositive issues have been raised in the present appeal:

1. Whether the Examiner erred in concluding that the claims are obvious principally based on the combination Wright in view of Cox, Musgrave, Busboom, Hale '536, Hale '798 and Velke '755.

2. Whether the Examiner erred in concluding that the claims are obvious principally based on the combination of Velke '031 in view of Cox, Musgrave, Busboom, Hale '536 and Hale '798, and alternatively in further view of Velke '755.

⁴ For clarity, the following enumerated Rejections utilize numbering that corresponds to the numbering of the "Issues" used by the Patent Owner in its briefs and by the Examiner in the RAN.

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ANALYSIS

Rejections 4 and 4A

Rejections 4 and 4A are based principally on the combination of Wright in view of Cox, Musgrave, Busboom, Hale '536, Hale '798 and Velke '755. All of the claims except claim 15 stand rejected in Rejection 4 as unpatentable over this combination of prior art (RAN 2-14). The Examiner finds that Wright teaches a mower with independent hydromotors, a mower deck 9 and a combustion engine 7 where the mower deck is mounted together and connected (RAN 2-3; *see also* FF 1A). However, the Examiner concedes that Wright "fails to teach that vertical adjustment of the mower deck enables movement of both the engine and the mower as one unit and fails to teach the specifics of the vertical deck adjustment mechanism." (RAN 3) (i.e., the recited "deck lift system for raising and lowering the cutter deck assembly, engine deck, and combustion engine together in order to adjust a blade cutting height of the mower" of the claims). Indeed, while Wright suggests including a mechanism for adjusting the height of cut (also referred to herein as "HOC"), it does not actually disclose a specific mechanism for doing so (FF 1B-1D).

For the actual HOC adjustment mechanism and the control arm, the Examiner relies Busboom that discloses a mower with "bell cranks 82, 104 and 76, 86, deck suspension chains 42, counterbalance springs 96, adjustment handle 54, height control pin 106[,] and control arms 40 pivotally connected to the mower deck (Figure 3)." (RAN 3). The Examiner concludes that "[i]t would have been obvious to one having ordinary skill in

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the art at the time of the invention, given the Wright suggestion of vertical height adjustability to have incorporated the Busboom HOC structures into the mower of Wright '138 as a mere substitution of known mechanisms for making mower decks 'vertically moveable or adjustable[.]'" (RAN 3; *see also* FF 2A-2E). The Examiner also finds that HOC adjustment in which "the engine moves with the cutting deck were well known in the art at the time of the invention" as evidenced by both Cox and Musgrave (RAN 3; *see also* FF 3A-4B). The Examiner states that given the teachings of Cox and Musgrave, "it would have been obvious to have arranged the modified Wright HOC adjustment to allow for the engine to move in concert with the deck structure as such HOC structures were well established alternatives for allowing an operator to change the cutting height." (RAN 3-4).

The Examiner concedes that "Wright as modified by Busboom, Cox and Musgrave would not necessarily provide for the claimed control arm length, i.e. that they are short enough such that 15 degree angular movement corresponds to 2.5 inches of vertical adjustment as claimed[.]" (RAN 4). However, the Examiner finds that Hale '536 and Hale '798 establish that different length control arms were known in the art and states that "[g]iven these combined teachings, merely adjusting the control arm length in the modified Wright system would have amounted to an obvious choice in engineering design in order to effect a desired range of vertical height adjustment." (RAN 4; *see also* FF 5, 6).

As to the position of the control arm pivot, the Examiner states that it being mounted forward of the foot platform would have been understood from Busboom "[s]ince the front wall of the Wright foot platform is the only

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structure directly to the rear of the deck[.]" and this attachment point would also be rearward of the front edge of the drive wheel (RAN 4). The Examiner states that the modified Wright system fails to teach that the control arm pivot is located forward of the foot platform (RAN 5). The Examiner relies on Velke '755 for its teaching that it is "desirable to extend the rear edge of the engine deck over the foot platform to conserve space and protect the operator's feet from flying debris" so that it would have been obvious to one of ordinary skill to have incorporated this feature for the noted safety and space saving benefits, and "[i]n doing so, the resultant control arm pivot would be located forward of the rear end of the engine deck 13 as claimed." (RAN 5; FF 8A-8C).

Thus, the Examiner's position is that it would have been obvious to apply the HOC adjustment mechanism of Busboom, including the disclosed chains and control arm, to provide stable, vertical adjustability to the deck of Wright where the engine moves with cutting deck as known in the art as demonstrated by Cox/Musgrave. In addition, it is also the Examiner's position that mounting the control arms' pivot in the location recited would have been obvious, especially in view of the safety and space benefits taught by Velke '755. The Examiner's position is supported by preponderance of the evidence. We address the Patent Owner's arguments *infra*.

The Patent Owner argues that even if the prior art references are combined, such combination does not result in the recited angle because the control arm of Busboom is too long (ABPO 9-10; *see also* Decl. of Wright ¶ 6). According to the Patent Owner, Busboom requires a control arm in order to stabilize the mower deck which is suspended by chains, and requires

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the long length to prevent slackening or tightening of the belt by minimizing fore/aft movement during raising and lowering of the mower deck (ABPO 11; *see also* Decl. of Wright, ¶ 7). In contrast, the Patent Owner asserts that in the claimed invention, engine and deck moves together so that slack in the belt is not an issue (ABPO 11-12). The Patent Owner argues that there is no teaching or suggestion to adjust control arm length or recognition that it is a result effective variable that is to be optimized (ABPO 12-13). The Patent Owner further argues that both of the Hale references are directed to automatic leveling systems that cannot be implemented in Wright (ABPO 13-14).

The Patent Owner's arguments are unpersuasive because they do not take into account what the collective teachings of the prior art. *See In re Keller*, 642 F.2d 413, 425 (CCPA 1981) ("The test for obviousness is not whether the features of a secondary reference may be bodily incorporated into the structure of the primary reference; nor is it that the claimed invention must be expressly suggested in any one or all of the references. Rather, the test is what the combined teachings of the references would have suggested to those of ordinary skill in the art"). It is not necessary that the inventions of the references must be physically combinable, without change, to render obvious the invention under review. *See In re Sneed*, 710 F.2d 1544, 1550 (Fed. Cir. 1983).

As the Examiner noted, Wright suggests a mechanism for adjusting the height of the mower deck, but fails to disclose the specifics thereof (FF 1C, 1D). Absent such information, one of ordinary skill in the art would have logically considered known HOC adjustment mechanisms to

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implement in the mower of Wright. Busboom is one such known mechanism. When implementing the HOC adjustment mechanism of Busboom in the mower of Wright, we agree with the Examiner (RAN 4) that it would have been obvious to provide control arms that are sized to be appropriate to the application so that when applied to the compact standing mower of Wright which has a compact frame, the control arms would be shorter than that disclosed in Busboom.⁵ (RAN 8). In this regard, we agree with the Requester that "[t]he logical reason for making the control arms shorter was merely to fit them into the more compact form of mower that Wright had **already** invented and patented in Wright '138 - to fit what Owner acknowledges in Wright '138 was the 'reduced overall length ' of the mower." (Resp. Br. R 9). We further agree with the Examiner (RAN 8) that the resultant application of the control arm into the existing compact structure satisfies the recited stabilization function.

The Patent Owner also argues that a person of ordinary skill in the art would not provide Busboom's control arm in the mower of Wright because there is no room and it would require substantial reconstruction and redesign rendering Wright unsuitable for its intended purpose of providing compact stand-on mower (ABPO 16-18). Again, these arguments are unpersuasive because they are based on bodily incorporation and fail to consider the combined teachings of the art and the skill of one of ordinary skill in the art.

⁵ While not forming the basis of our decision, we also observe that size is not ordinarily a patentable feature. *In re Rose*, 220 F.2d 459, 463 (CCPA 1955) ("size of the article under consideration [] is not ordinarily a matter of invention"); *see also Gardner v. TEC Systems, Inc.*, 725 F.2d 1338, 1346, (Fed. Cir. 1984); *In re Kirke*, 40 F.2d 765, 767 (CCPA 1930).

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See In re Keller, 642 F.2d at 425; *In re Sneed*, 710 F.2d at 1550. Persuasive evidence has not been provided that implementing Busboom's HOC adjustment mechanism in Wright's mower by appropriately sizing it to fit would have been beyond the skill of those in the art. *KSR*, 550 U.S. at 417.

The Patent Owner contends that Wright has no chains and there is no need to provide a control arm because "the cutter deck 9 in Wright is already structurally connected to engine deck 13 and frame 11" (ABPO 18, 21-22). The Patent Owner further argues that neither Cox nor Musgrave discloses any uncontrolled lateral movement and "[o]ne would not have added a control arm to Wright/Musgrave or Wright/Cox to address an alleged problem that did not exist or, at worst, was already solved." (ABPO 23-24).

However, as noted above, while Wright suggests a HOC adjustment mechanism, it does not disclose a particular mechanism. Hence, when the HOC adjustment mechanism of Busboom which includes chains is implemented in the mower of Wright, a person of ordinary skill in the art would have also provided a stabilizer rod (i.e., a control arm) disclosed in Busboom for stabilization of the mower deck. While the mower of Wright discloses that the "mower deck 9 is mounted on and connected to both engine deck 13 and frame 11" (FF 1A), this does not preclude relative movement between the mower deck and the engine deck (*see* Resp. Br. PO 13-14 (Patent Owner agreeing with the Examiner that the mower deck and the engine deck of Wright can be "mounted on" each other and "connected,"

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but "not necessarily move up/down together as one unit.")⁶; *see also* FF 4A, 4B). Wright also does not teach against the use of a mower deck supported by chains which is well-known in the art and indeed present in the Busboom mower (*see* Busboom, Figs. 3, 4) and not in dispute between the parties. Thus, while the Patent Owner asserts that a control arm may not be necessary in a mower based on the combination of Wright/Musgrave or Wright/Cox, when the mower deck height control mechanism 44 of Busboom with its chains is implemented in the Wright's mower to provide the various functions thereof, a control arm would be desirable to stabilize the mower deck.

The Patent Owner also argues that Wright criticizes sit-down mowers like that of Busboom (ABPO 17-18). However, while Wright may criticize sit-down mowers because of high centers of gravity and the difficulty of users in ducking under low hanging tree limbs (*see* Wright, col. 1, l. 60-col. 2, l. 6), this teaching does not provide a correlation between the HOC adjustment mechanisms known in the art and the seating position of the user. Thus, the criticism in Wright with respect to seating position would not dissuade one of ordinary skill in the art from implementing the HOC adjustment mechanism that is also taught in Busboom. Furthermore, as noted by the Requester, Wright '138 also "criticizes" many different kinds of mowers which would, according to the Patent Owner's logic, result in the

⁶ In response to questioning regarding relative movement between the engine, the engine deck and the cutting deck in the mower of Wright, the Patent Owner's legal representative Mr. Rhoa also stated:

MR. RHOA: Wright 138, yes. Is it possible that there is some movement there between? Yes, it's possible.

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untenable position of removing a substantial body of art pertinent to mowers from consideration (Resp. Br. R 15 and citations therein). Nonetheless, a known or obvious product "does not become patentable simply because it has been described as somewhat inferior to some other product for the same use." *In re Gurley*, 27 F.3d 551, 553 (Fed. Cir. 1994). The Patent Owner also takes issue with the Examiner's statement that "[g]iven these combined teachings, merely adjusting the control arm length in the modified Wright system would have amounted to an obvious choice in engineering design in order to effect a desired range of vertical height adjustment." (RAN 4). The Patent Owner argues that the "proposed rationale for the alleged shortening of Busboom's control arm length is technically inaccurate and fundamentally flawed" because the length of the control arm in Busboom "does not determine or effect the range of vertical height adjustment of the cutter deck." (ABPO 15-16, *citing* Decl. of Wright ¶ 8). The Patent Owner argues that "the length of control arm 40 in Busboom has nothing to do with determining/effecting the range of vertical height adjustment of the cutter deck." (*Id.*).

We are not persuaded that the Examiner erred. Firstly, the Patent Owner misstates the Examiner. The Examiner did not say that the control arm "*determine[s]* or effect the range of vertical height adjustment *of the cutter deck*" as asserted by the Patent Owner (emphasis added). Secondly, the Examiner stated that the phrase has been taken "out of context" by the Patent Owner and in view of the apparent misunderstanding, explained that "[c]learly it is not the control arms that control the height adjustment. In the proposed rejection, the control arms allow, thus effect, *the vertical height*

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range that was claimed for the control arms, but do not actually perform, i.e. directly cause the height adjustment." (RAN 9, emphasis added). In other words, by virtue of their connection to the mower deck, the control arms move as the vertical height of the mower deck is adjusted to result in the vertical height adjustment range *of the control arm* of "no more than about 2.5 inches" as articulated in the claims. Indeed, the paragraph in which the statement at issue occurs sets the context by beginning with the statement that "Wright as modified by Busboom, Cox and Musgrave would not necessarily provide for the claimed control arm length, i.e. that they are short enough such that 15 degree angular movement *corresponds to 2.5 inches of vertical adjustment as claimed*[" (RAN 4, emphasis added). Thus, we agree with the Examiner that the Patent Owner has taken the statement at issue "out of context," and the Examiner has adequately clarified the statement misunderstood by the Patent Owner.

Thirdly, the crux of the Examiner's articulated reason for the rejection is that "merely adjusting the control arm length in the modified Wright system would have amounted to an obvious choice in engineering design" based on the evidence of record including Busboom and the Hale references (RAN 4). In this regard, the Examiner also stated that:

Those having ordinary skill in the art would have understood that in incorporating the HOC structures of a sitting mower in a more compact standing mower as Wright as suggested into the rejection, that certain aspects would have needed to be adjusted to accommodate the parts... Plainly, those in the art would have understood that moving the Busboom HOC structures to a compact frame would have required shorter control arms, especially when the art was well aware that

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different frame structures require different length control arms as evidenced by the Hale patents.
(RAN 8).

In addition, the Examiner further stated that:

Those having ordinary skill in the art would have understood that when stabilization was required, control arms can be used as evidenced by any of Busboom or the Hale patents. Clearly it can be gleaned from those teachings that control arms do not have a finite length, but are instead dependent upon the distance between the mower deck and the portion of the frame that the engineer/designer sees fit to establish the requisite degree of stability. When attempting to stabilize in a more compact mower design such as Wright's, it is only reasonable to conclude that those in the art would have understood that shorter control arms would have been required to fit into that more compact system.
(RAN 9-10).

We also highlight the fact that the explanation for the statement at issue was first provided in the Action Closing Prosecution of March 6, 2012, pages 4, 8-10. Thus, the Patent Owner had ample opportunity to respond, and the Patent Owner did respond, to the substance of the rejection as discussed above. To the extent that the Patent Owner believes that the clarification changed the ground of rejection as articulated in the Non-Final Office Action, the Patent Owner could have petitioned to have the rejection denominated as a new ground of rejection and prosecution reopened.

Finally, the Patent Owner observes that the claims require the rear pivot axis of the control arm to be located "forward of a rear end of the engine deck assembly." (ABPO 24). The Patent Owner asserts that "[t]he rear of the engine deck 13 in Wright essentially abuts the front wall 89 of the platform structure, and therefore there is no way to extend the engine deck

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farther rearwardly as alleged in the Office Action." (ABPO 24). However, this argument is unpersuasive because it is again essentially based on bodily incorporation, and does not account for accommodating the extended engine deck in the manner shown in Figure 5 of Velke '755 to which the teachings regarding the safety and space benefits are directed (FF 8C). *See In re Keller*, 642 F.2d at 425.

As to claims 4 and 6, the Patent Owner does not provide any separate arguments as to their patentability (ABPO 25). As to claim 17, the Patent Owner observes that it requires control arms that are even shorter than that of claim 1, but does not proffer arguments that substantively differ from those already considered (ABPO 25). The Patent Owner also does not proffer separate arguments with respect to claims 3, 7-14 and 16.

In view of the above, the Examiner has set forth a *prima facie* case of obviousness with respect to Rejection 4 which was not rebutted by the Patent Owner considering the totality of the evidence. We therefore affirm the Examiner. The Patent Owner relies on the same arguments with respect to claim 15 rejected in Rejection 4A (ABPO 26) which is also principally based on the combination of Wright in view of Cox, Musgrave, Busboom, Hale '536, Hale '798 and Velke '755. Thus, we affirm Rejection 4A as well.

Rejection 6

Rejection 6 rejects all of the claims as obvious over the combination of Velke '031 in view of Cox, Musgrave, Busboom, Hale '536 and Hale '798, and alternatively in further view of Velke '755 (RAN 14-19). The Examiner's rejection is substantively similar to Rejection 4 except that prior

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art reference Velke '031 is substituted for Wright (RAN 19; ABPO 26). In particular, Velke '031 teaches a zero turn radius mower with a foot platform wherein height of cut is adjusted by changing the mounting each front caster wheel and wheel/drive motor using mounting holes (FF 7A, 7C). Hence, Velke '031 differs from Wright discussed *supra* in that Velke '031 does disclose an HOC adjustment mechanism. The Examiner concludes that using the HOC adjustment mechanism of Busboom instead of that provided in Velke '031 is a "mere substitution of known mechanisms for making mower decks vertically moveable or adjustable and to incorporate the added bonus of ease of adjustment to Velke ['031]." (RAN 15). As to the provision of a control arm and the length thereof, the disagreement and arguments between the Patent Owner and the Examiner are substantively the same as those discussed *supra* relative to Rejection 4 (RAN 16; ABPO 27-32).

For the reasons substantially similar to those already discussed *supra* relative to Rejection 4, we find no error in the Examiner's rejection. We further add that providing ease of adjustment as articulated by the Examiner is another rational reason for implementing the HOC adjustment mechanism of Busboom that uses a lever, the HOC adjustment in Velke '031 of adjusting each wheel height being cumbersome in comparison (*see* Resp. Br. R 19-20). We further agree with the Examiner that modification of the length of the control arm would have been obvious to one of ordinary skill in the art for the reasons already discussed. We also note that in contrast to Rejection 4, the Patent Owner does not submit arguments as to the specific positioning of the rear pivot axis of the control arm in response to the Examiner's findings that the modified Velke '031 appears to satisfy the

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positioning recited, and even if it did not, the application of teachings in Velke '755 results in such positioning (RAN 16-17).

As to claims 4 and 6, the Patent Owner again does not provide any separate arguments as to their patentability (ABPO 32). As to claim 17, the Patent Owner again observes that it requires control arms that are even shorter than that of claim 1, but does not proffer arguments that substantively differ from those already considered (ABPO 32-33). The Patent Owner also does not proffer separate arguments with respect to claims 3, 7-14 and 16.

Correspondingly, we find that the Examiner has set forth a *prima facie* case of obviousness with respect to Rejection 6 and we affirm the same.

CONCLUSIONS

1. The Examiner did not err in concluding that the claims are obvious principally based on the combination Wright in view of Cox, Musgrave, Busboom, Hale '536, Hale '798 and Velke '755.

2. The Examiner did not err in concluding that the claims are obvious principally based on the combination of Velke '031 in view of Cox, Musgrave, Busboom, Hale '536 and Hale '798, and alternatively in further view of Velke '755.

3. We do not reach the Cross-Appeal of the Requester.

Requests for extensions of time in this *inter partes* reexamination proceeding are governed by 37 C.F.R. §§ 1.956.

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AFFIRMED

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EXAMINER

JASTRZAB, JEFFREY R

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02/14/2014

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

THE TORO COMPANY
Requester, Cross-Appellant, Respondent

v.

WRIGHT MANUFACTURING, INC.
Patent Owner, Appellant, Respondent

Appeal 2013-002900
Inter partes Reexamination Control 95/001,742
Patent US 6,935,093 B2
Technology Center 3900

Before RICHARD M. LEBOVITZ, JEFFREY B. ROBERTSON and
DANIEL S. SONG, *Administrative Patent Judges*.

SONG, *Administrative Patent Judge*.

DECISION ON REQUEST FOR REHEARING

The Patent Owner filed PATENT OWNER'S REQUEST FOR REHEARING on July 19, 2013 (hereinafter "Rehearing Request" or "Rhrq. Req.") under 37 C.F.R. § 41.79 seeking rehearing of our Decision mailed June 21, 2013 (hereinafter "Decision" or "Dec.") which affirmed the final

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rejections of the claims made by the Examiner.¹ The Patent Owner asserts that the Board overlooked various facts and requests modification of the Decision.

We grant the Rehearing Request to the extent that we consider the Patent Owner's arguments *infra*, but DENY the request to modify the Decision.

Preliminarily, we observe that the Requester has filed THIRD PARTY REQUESTER'S COMMENTS OPPOSING PATENT OWNER'S REQUEST FOR REHEARING on August 17, 2013 (hereinafter "Requester's Comments" or "Req. Com."). Upon consideration, we agree with the Requester's Comments and cite to portions thereof *infra* as supplemental to our discussion.

Velke '031 in View of Cox, Musgrave, Busboom, Hale '536 and Hale '798

The Patent Owner asserts that the Board overlooked the fact that "in Velke '031 (the base reference) the cutter deck is rigidly connected to the engine deck 3" so that "[t]here can be no relative movement between the cutter deck and the engine deck 3." (Rhrq. Req. 1). Hence, the Patent Owner concludes that "one of ordinary skill in the art would not have modified Velke '031 by adding Busboom's stabilizing rod ... because there

¹ A substantially identical Request for Rehearing has been filed with respect to the Board's decision also mailed June 21, 2013 for Appeal No. 2013-002864 (Reexamination Control 95/001,741 for Patent US 6,438,931). The Board's decision with respect to that Request for Rehearing is being mailed concurrently herewith.

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is no uncontrolled movement [between the cutter deck and the engine deck] to stabilize." (Rhrq. Req. 1; *see also* Rhrq. Req. 2).

The Patent Owner misapprehends the fact that the main rejection based on Velke '031 is not based on merely incorporating Busboom's stabilizer rod into the mower of Velke '031. Rather, the rejection is based on implementing the height-of-cut (hereinafter "HOC") adjustment mechanism of Busboom into the mower of Velke '031 (Dec. 22 *citing* Right of Appeal Notice (hereinafter "RAN") 15-16; *see also* Req. Com. 2-3). As first explained in the Decision with respect to the rejection based principally on Wright '138, the HOC adjustment mechanism of Busboom would include the chain links and the stabilizing rods (Dec. 16). The reasons articulated by the Examiner for the combination based on Velke '031 are that: using the HOC adjustment mechanism of Busboom is merely a substitute for changing the mounting of each wheel which is disclosed in Velke '031; and such combination would provide ease of adjusting the HOC as compared to the adjustment disclosed in Velke '031 (Dec. 22; RAN 15). We agreed with the Examiner, the reasons articulated being rational and sufficient to support the conclusion of obviousness (Dec. 22; *see also* Req. Com. 3).

The Patent Owner argues that Velke '031 "already has a system for adjusting the height-of-cut" so that there would be no reason to replace it with the HOC adjustment mechanism of Busboom (Rhrq. Req. 3). However, as noted *supra* and pointed out in the Decision, the HOC adjustment mechanism of Busboom which uses a lever that is simply grasped by the user and moved to adjust the HOC would make such adjustment easier as compared to the cumbersome method disclosed in

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Velke '031 wherein the height of each wheel must be adjusted separately (Dec. 22).

The Patent Owner further asserts that the stabilizing purpose of Busboom's control arm requires it to be long in order to reduce movement of the cutter deck thereby teaching away from the claims that require short control arms which would reduce the stabilizing function (Rhr. Req. 3). However, the Patent Owner's assertion is not explained or substantiated by persuasive evidence. Our understanding is that control arms such as those disclosed in Busboom and the subject '248 patent are rigid structural members which are pivotably mounted to the mower deck and the frame. It is not apparent how shortening a control arm so as to be appropriately dimensioned for a smaller mower as set forth in the rejection would reduce the stabilizing function of the control arm.

Wright '138 in View of Cox, Musgrave, Busboom, Hale '536 and Hale '798

The Patent Owner initially asserts that the Board overlooked the fact that "both parties agreed at the Oral Hearing that in Wright '138 (the base reference) the cutter deck 9 is probably rigidly connected to the engine deck 13 so that the cutter deck 9 and engine deck 13 move together as one unit." (Rhr. Req. 4-5). The Patent Owner argues that "this agreement as to the content of Wright '138 cannot be ignored" and "[t]he Board's Finding of Fact 1(B) improperly ignores this agreement." (Rhr. Req. 5). The Patent Owner also argues that Wright '138 does not include chains and the cutter deck is already structurally connected to the engine deck and the frame so that there

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is no need to stabilize anything by adding Busboom's control arm (Rhrgr. Req. 5-6). The Patent Owner's arguments are unpersuasive.

Firstly, facts are established by the evidence, not by mere "agreement" between the parties. Secondly, Finding of Fact 1.B. was that Wright '138 does not disclose the manner in which the mower deck is mounted/connected to the frame and engine deck, or require that the mower deck be fixed in position relative to the engine deck so as to preclude relative movement therebetween. (Dec. 5-6, FF 1.B.).

In other words, Wright '138 does not disclose sufficient detail to allow a determination that there is no relative movement between the mower deck and the engine deck. The factual finding was neither that Wright '138 discloses relative movement, nor that it discloses no relative movement.

Thirdly, the Patent Owner itself conceded the possibility that the mower deck Wright '138 may be mounted and connected to the engine deck/frame in a manner which allows for relative movement therebetween (Dec. 16-17 *citing* Resp. Br. PO 11-12; *see also* excerpts from the Oral Hearing set forth in Dec. 17, n.6 and Req. Com. 5).

The conclusion drawn in the Decision was that "while Wright suggests including a mechanism for adjusting the height of cut [], it does not actually disclose a specific mechanism for doing so (FF 1B-1D)." (Dec. 11; *see also* Req. Com. 4-5). The Patent Owner's erroneous assertion regarding the disclosure of Wright '138 notwithstanding, the Patent Owner again misapprehends the basis of the main rejection based on Wright '138 that was affirmed in the Decision by arguing that Wright '138 does not include chains so there is no need for stabilization by adding Busboom's control arm (Rhrgr. Req. 5-6).

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As noted, Wright '138 does not disclose a mechanism for adjusting HOC (Dec. 14; Dec. 5, FF 1B-1D). Hence, we explained,

[a]bsent such information, one of ordinary skill in the art would have logically considered known HOC adjustment mechanisms to implement in the mower of Wright. Busboom is one such known mechanism. When implementing the HOC adjustment mechanism of Busboom in the mower of Wright, we agree with the Examiner (RAN 4) that it would have been obvious to provide control arms that are sized to be appropriate to the application so that when applied to the compact standing mower of Wright which has a compact frame, the control arms would be shorter than that disclosed in Busboom. (RAN 8). (Dec. 14-15).

Finally, the Patent Owner argues that there are no chains in Cox or Musgrave either so that there is nothing to stabilize (Rhrq. Req. 6-7). However, the Patent Owner again misses the point that Wright '138 does not disclose a mechanism for HOC adjustment, and that the affirmed rejection is based on using the known HOC adjustment mechanism of Busboom.

REHEARING DECISION

While we have considered the Decision in light of the Request for Rehearing, and have elaborated on certain aspects of the Decision, we decline to modify it in any respect.

DENIED

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ack
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US006438931B1

(12) **United States Patent**
Velke et al.

(10) **Patent No.:** **US 6,438,931 B1**(45) **Date of Patent:** **Aug. 27, 2002**

(54) **POWER LAWN MOWER INCLUDING
SHORTENED CONTROL ARMS FOR USE IN
DECK LIFT SYSTEM**

(75) Inventors: **James D. Velke**, Germantown; **William R. Wright**, Clarksburg, both of MD (US)

(73) Assignee: **Wright Manufacturing, Inc.**, Frederick, MD (US)

(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 0 days.

(21) Appl. No.: **09/714,824**

(22) Filed: **Nov. 17, 2000**

Related U.S. Application Data

(63) Continuation-in-part of application No. 09/412,589, filed on Oct. 5, 1999, now Pat. No. 6,205,753.

(51) Int. Cl.⁷ **A01D 34/03**; A01D 34/43; A01D 34/64

(52) U.S. Cl. **56/14.7**; 56/16.7

(58) Field of Search 56/14.7, 15.5, 56/16.7, 15.4, 10.1, 32.3, 12.7, DIG. 10; 180/6.48, 6.5, 6.62, 19.1, 19.3, 19.2; 280/870.43, 760, 32.7

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Primary Examiner—Robert E. Pezzuto

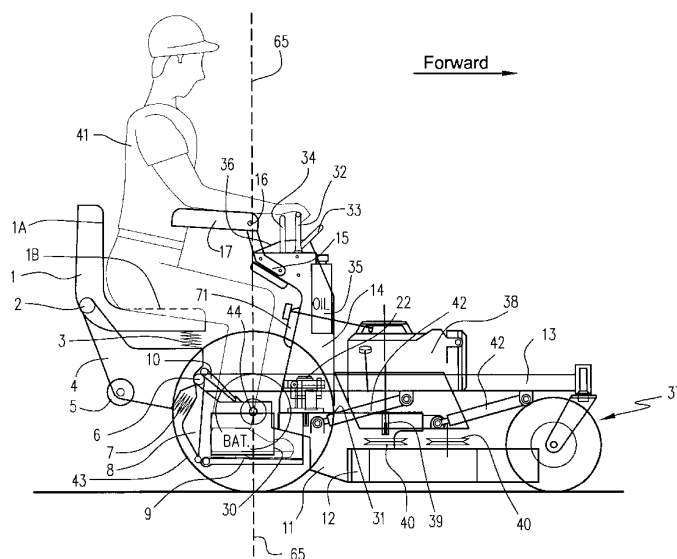
Assistant Examiner—Árpád F Kovács

(74) *Attorney, Agent, or Firm*—Nixon & Vanderhye P.C.

(57) **ABSTRACT**

A self-propelled power lawn mower having a deck lift system for raising and lowering the cutter deck assembly together with the engine deck and engine as a single unit to adjust the cutting height of the mower. Control arms are short enough length so that pivoting of the control arms an angle Φ of fifteen degrees during raising or lowering of the cutter deck assembly causes the cutter deck assembly to move a vertical distance "d" of no more than about 2.5 inches.

14 Claims, 26 Drawing Sheets



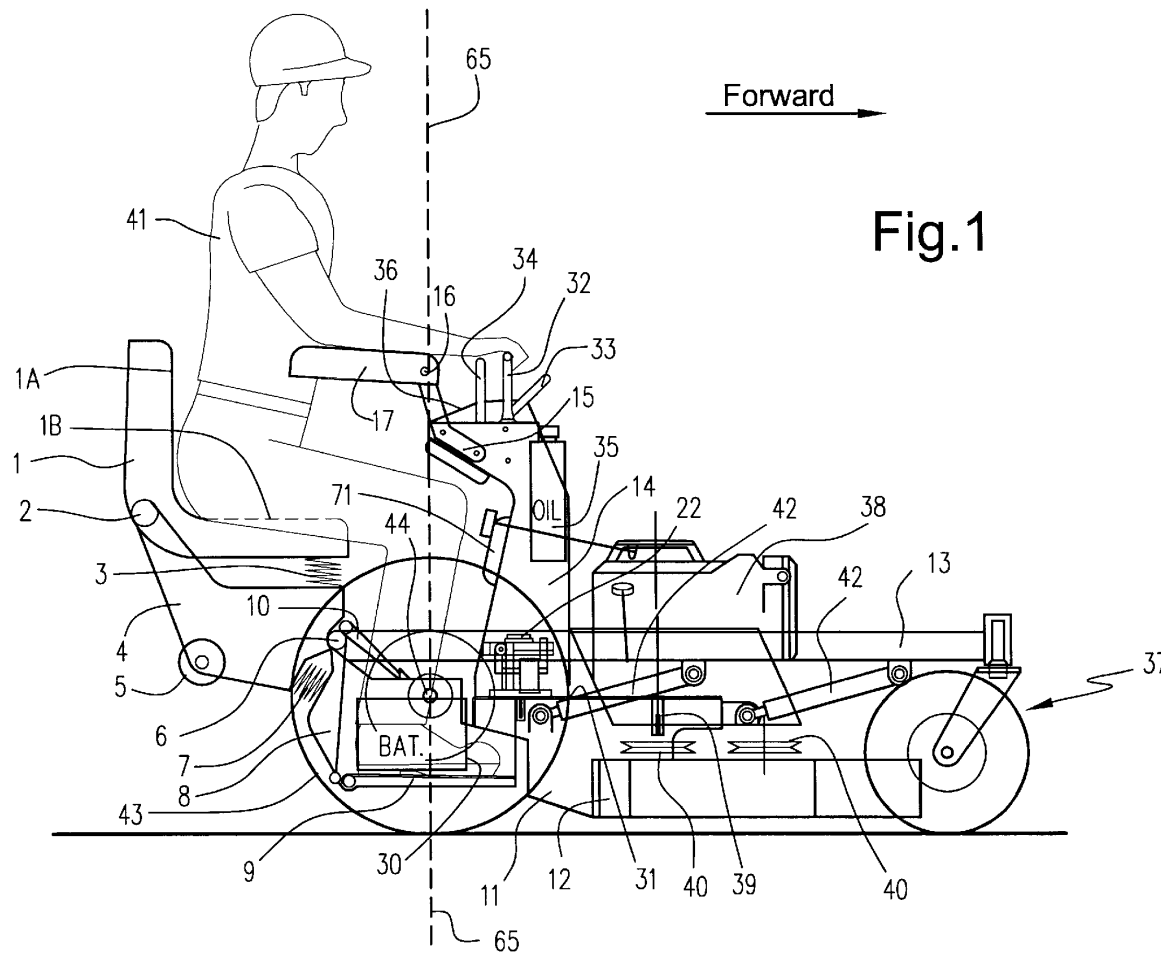
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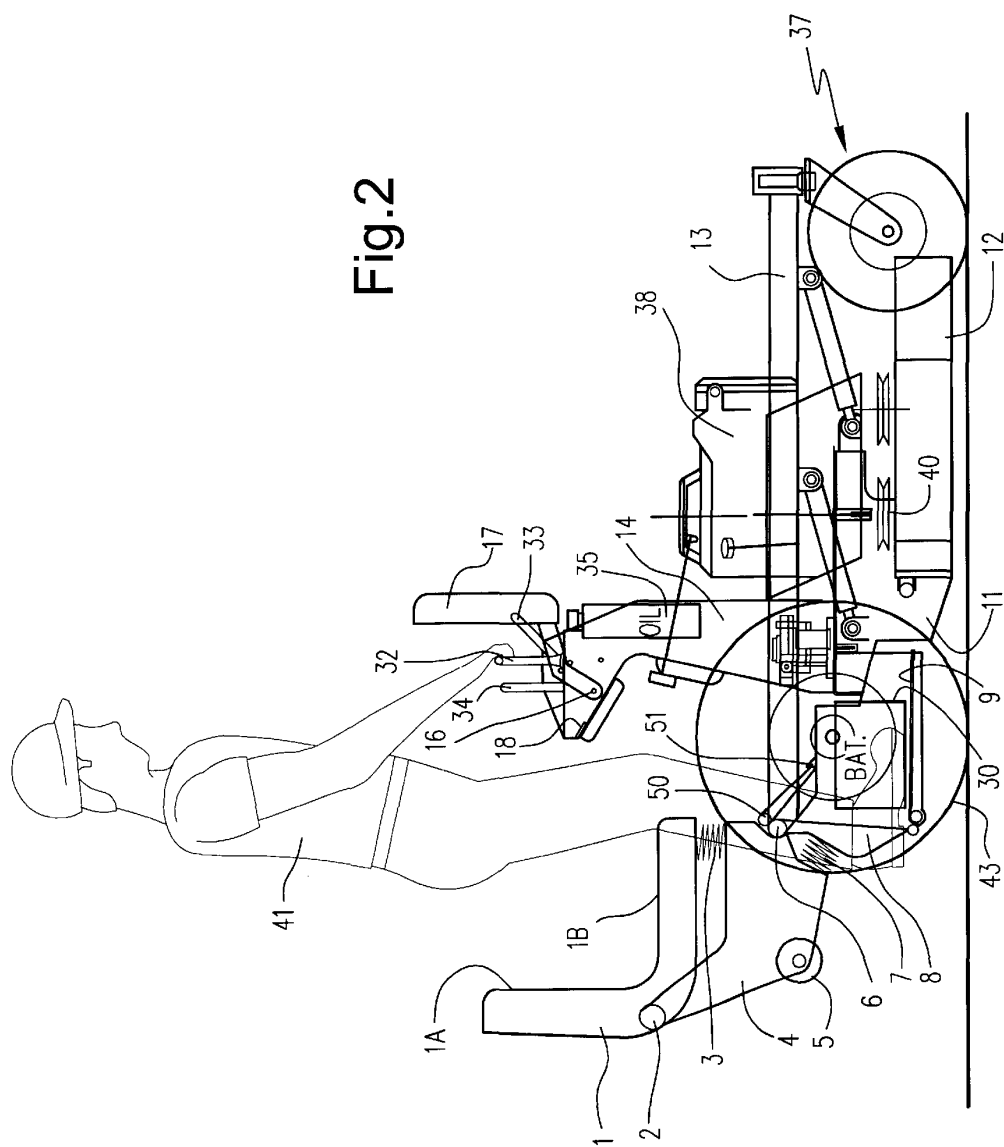
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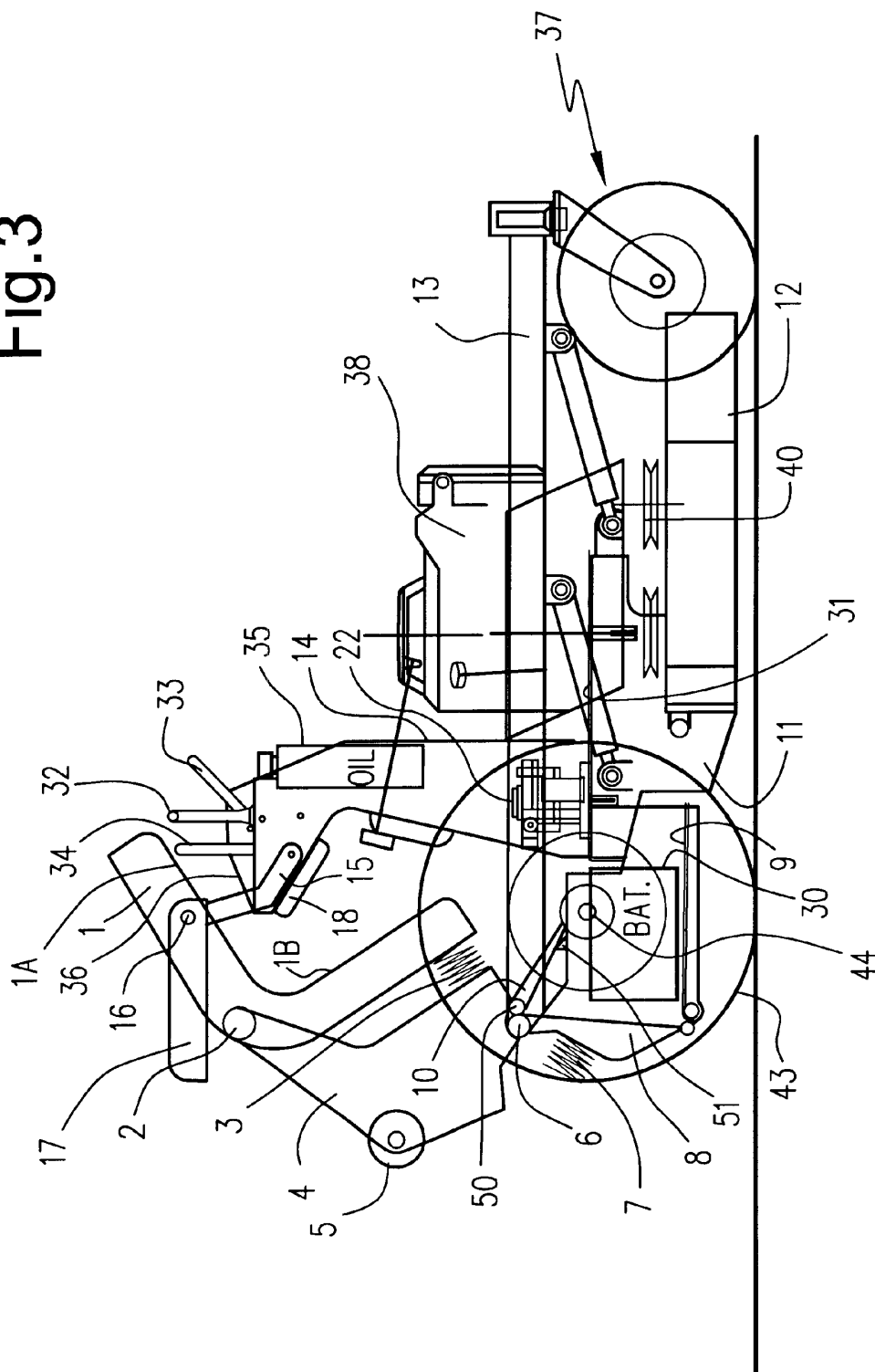
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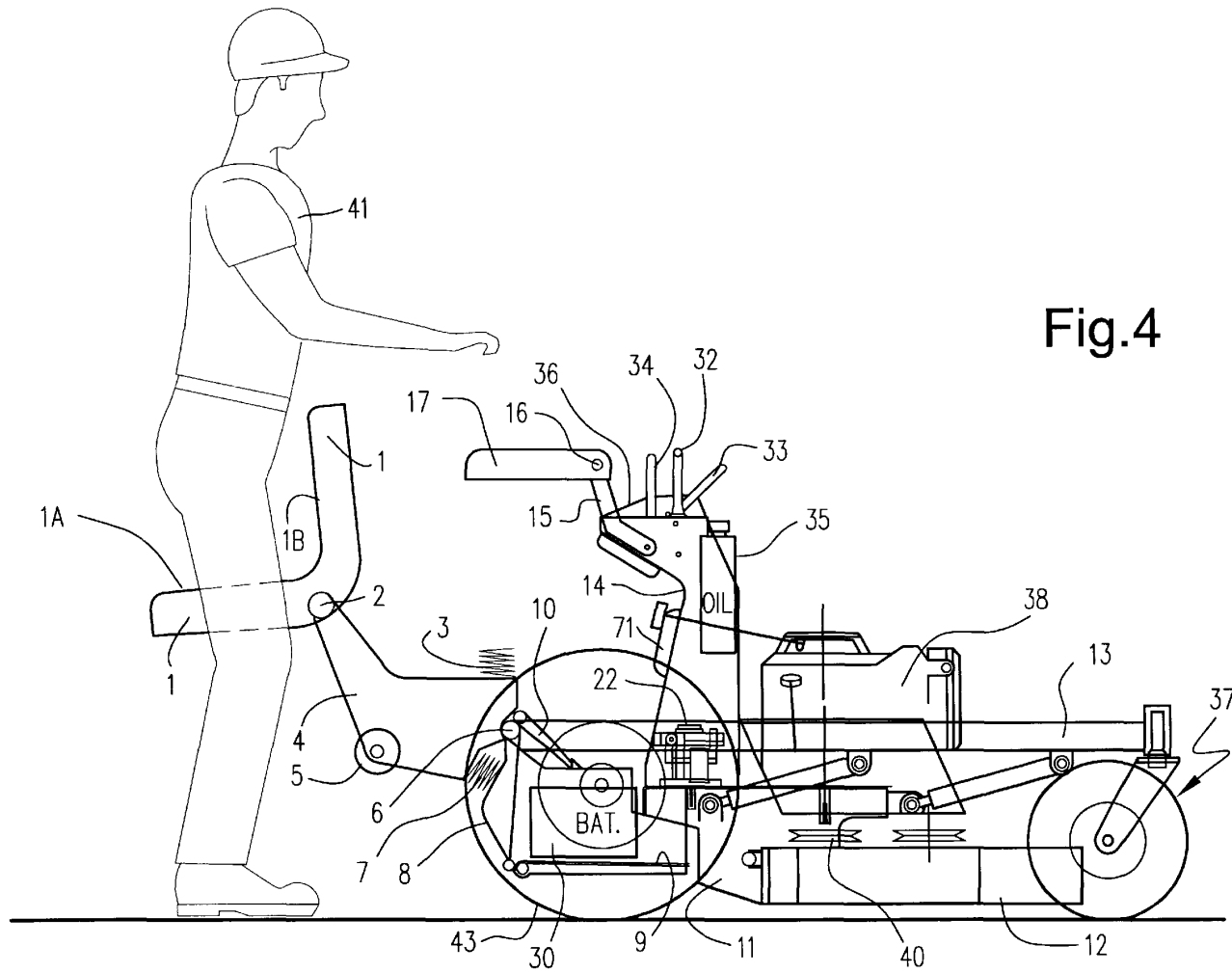
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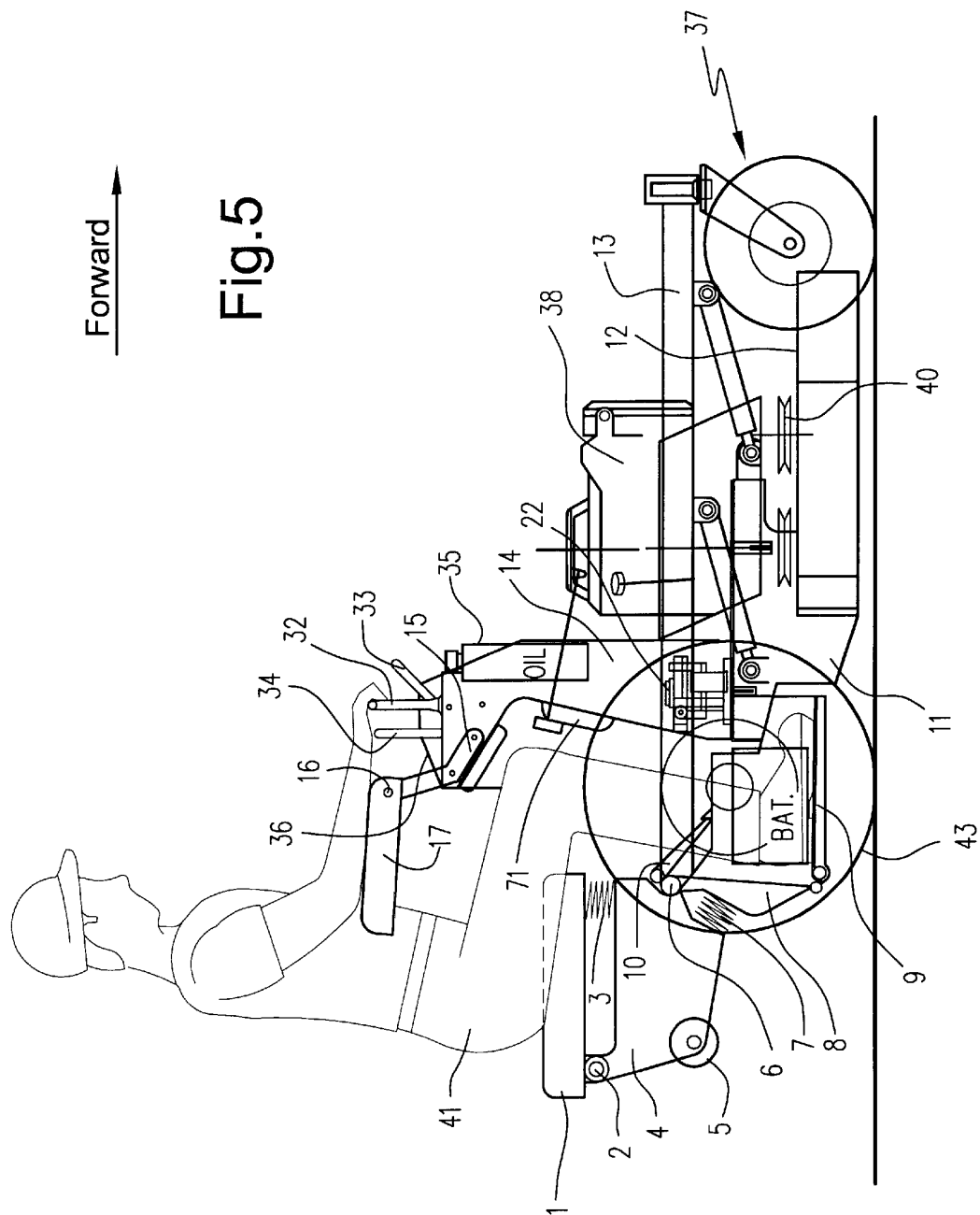
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Fig. 3







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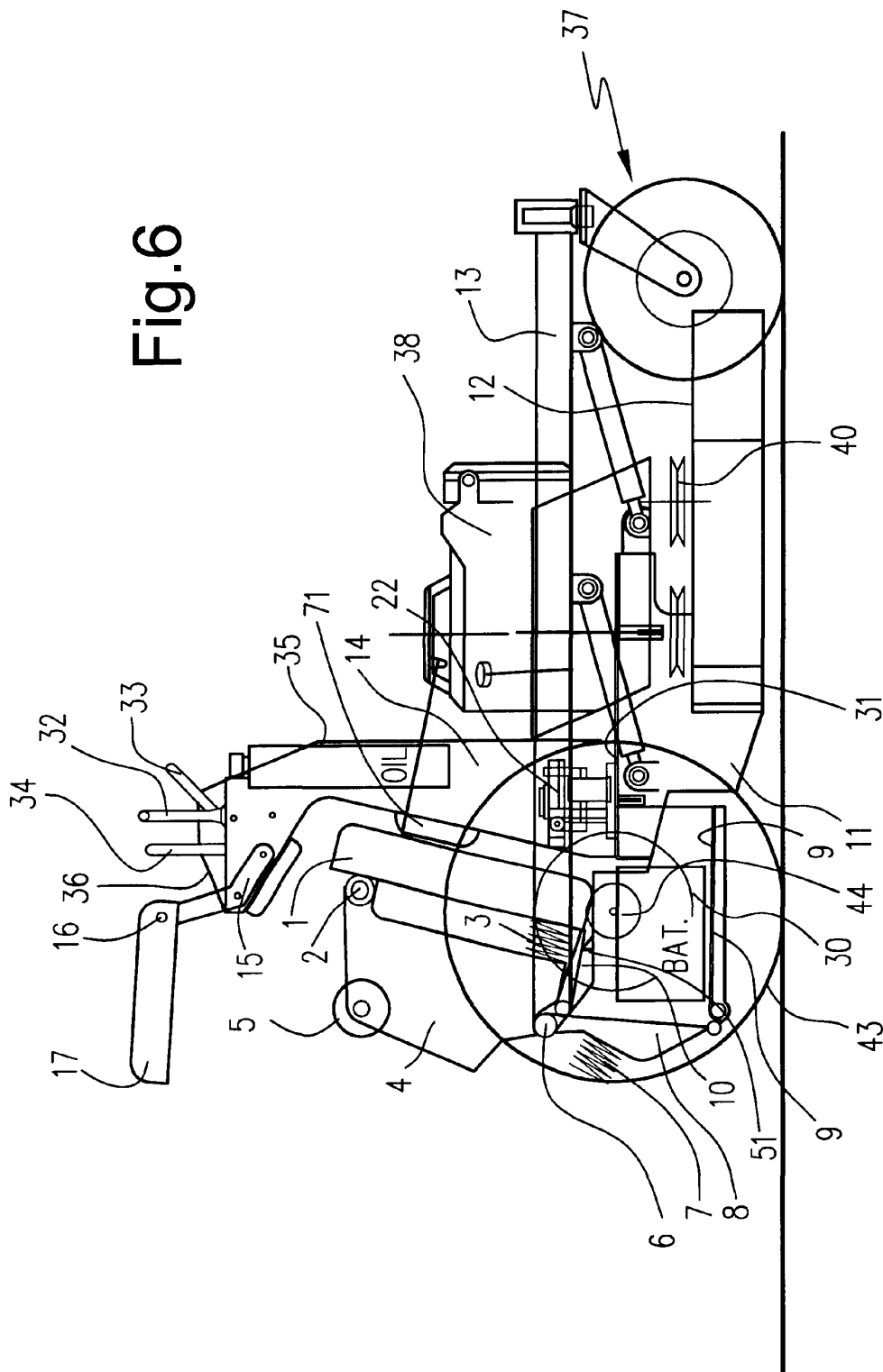
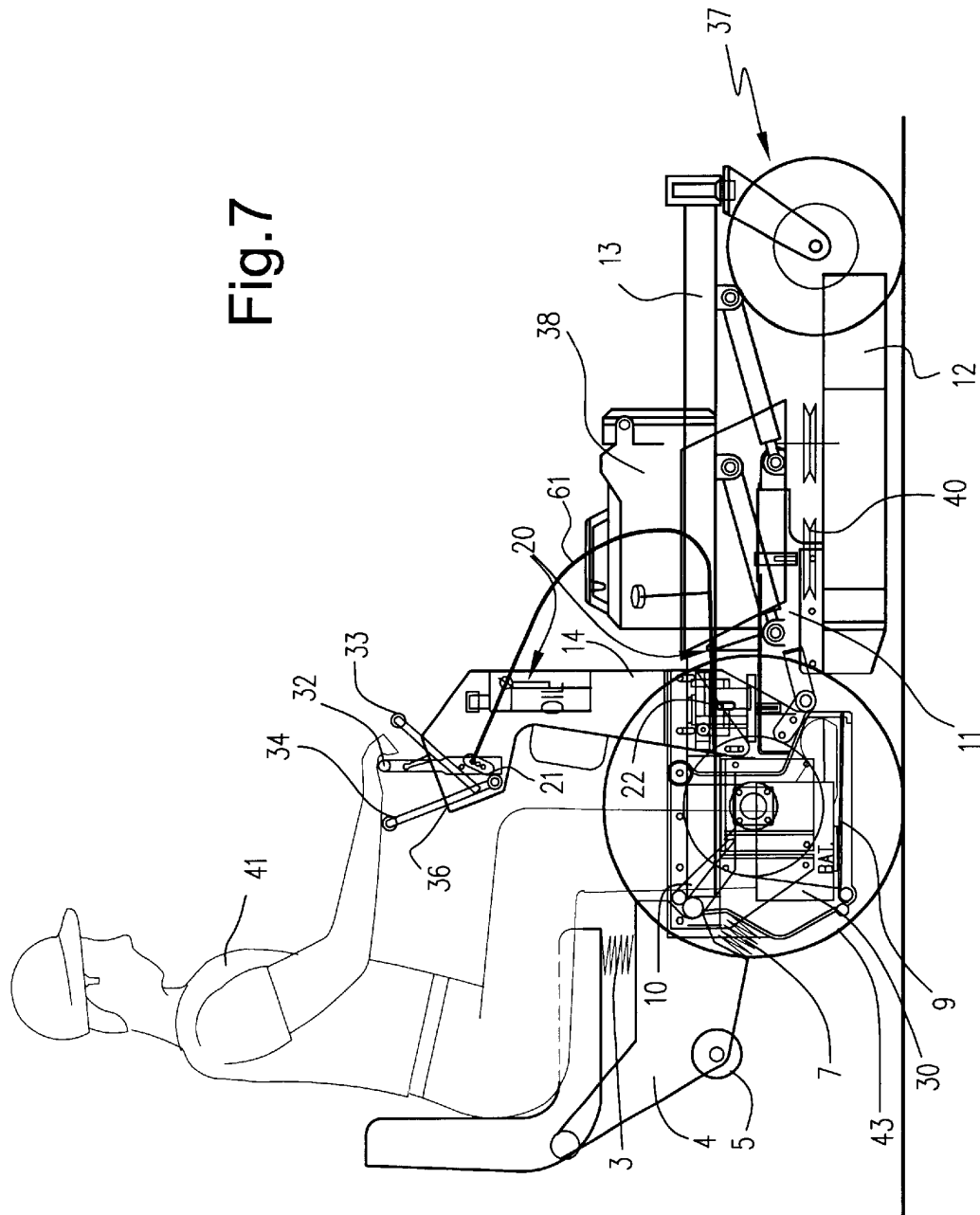


Fig. 7



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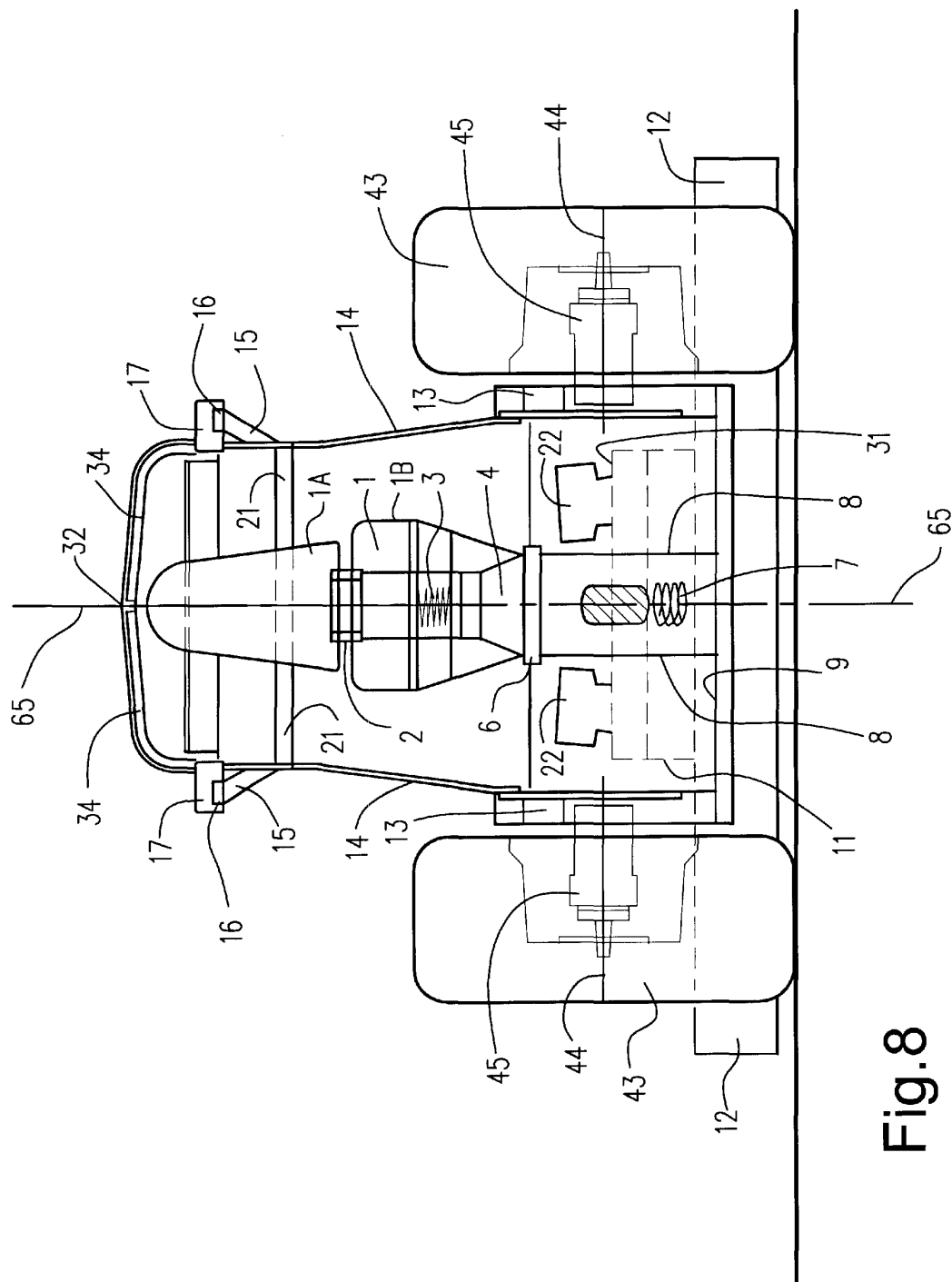


Fig. 8

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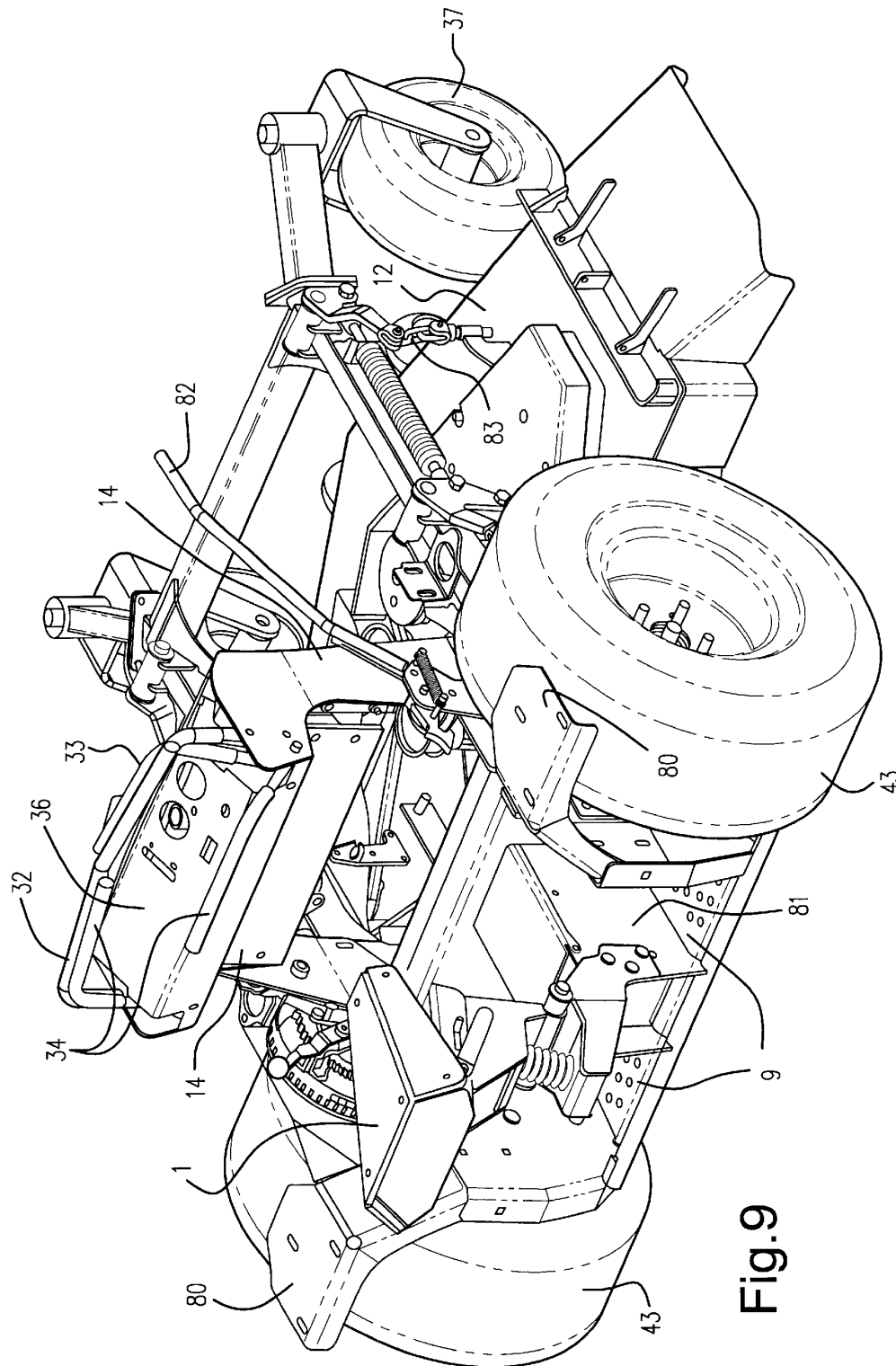
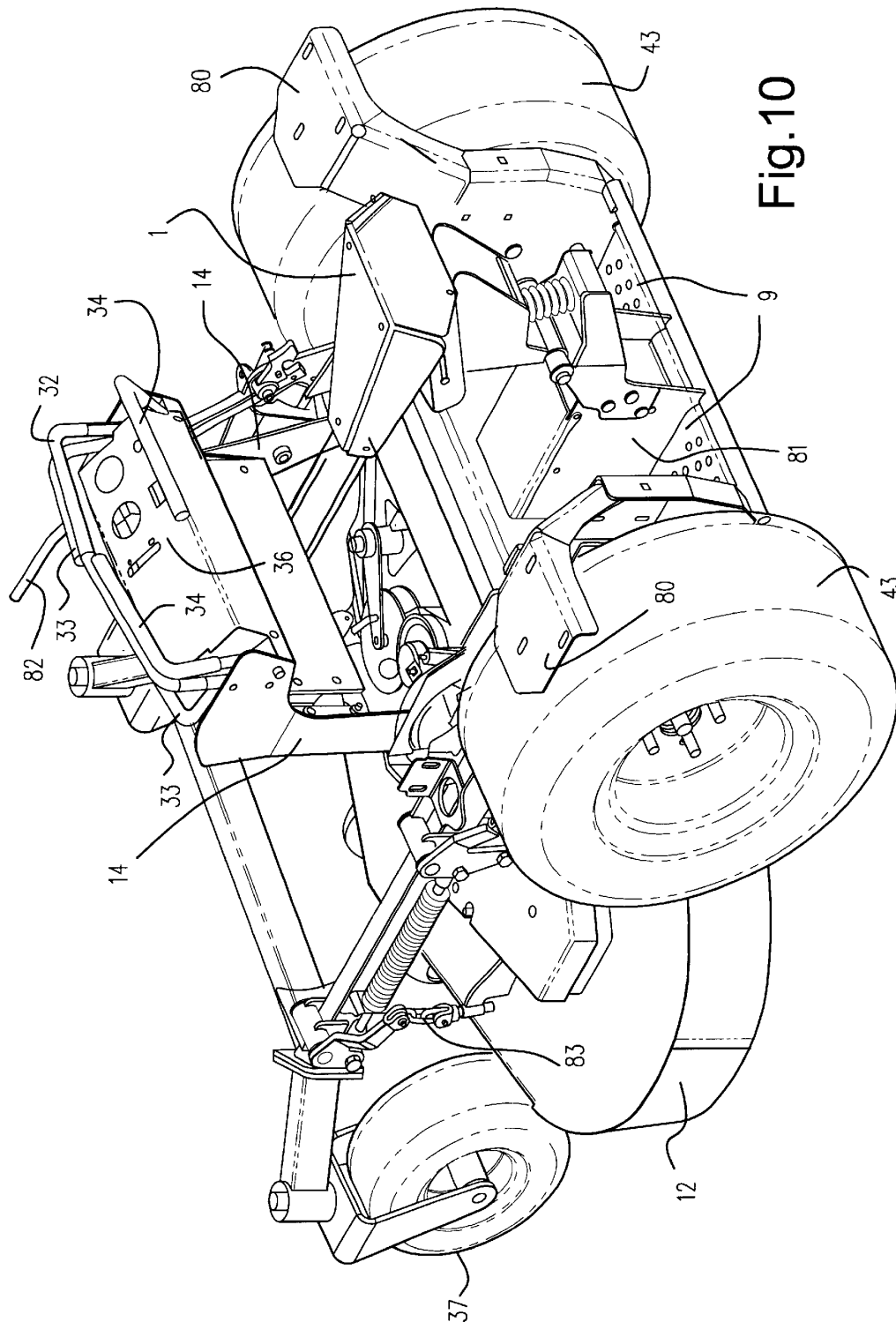


Fig.9

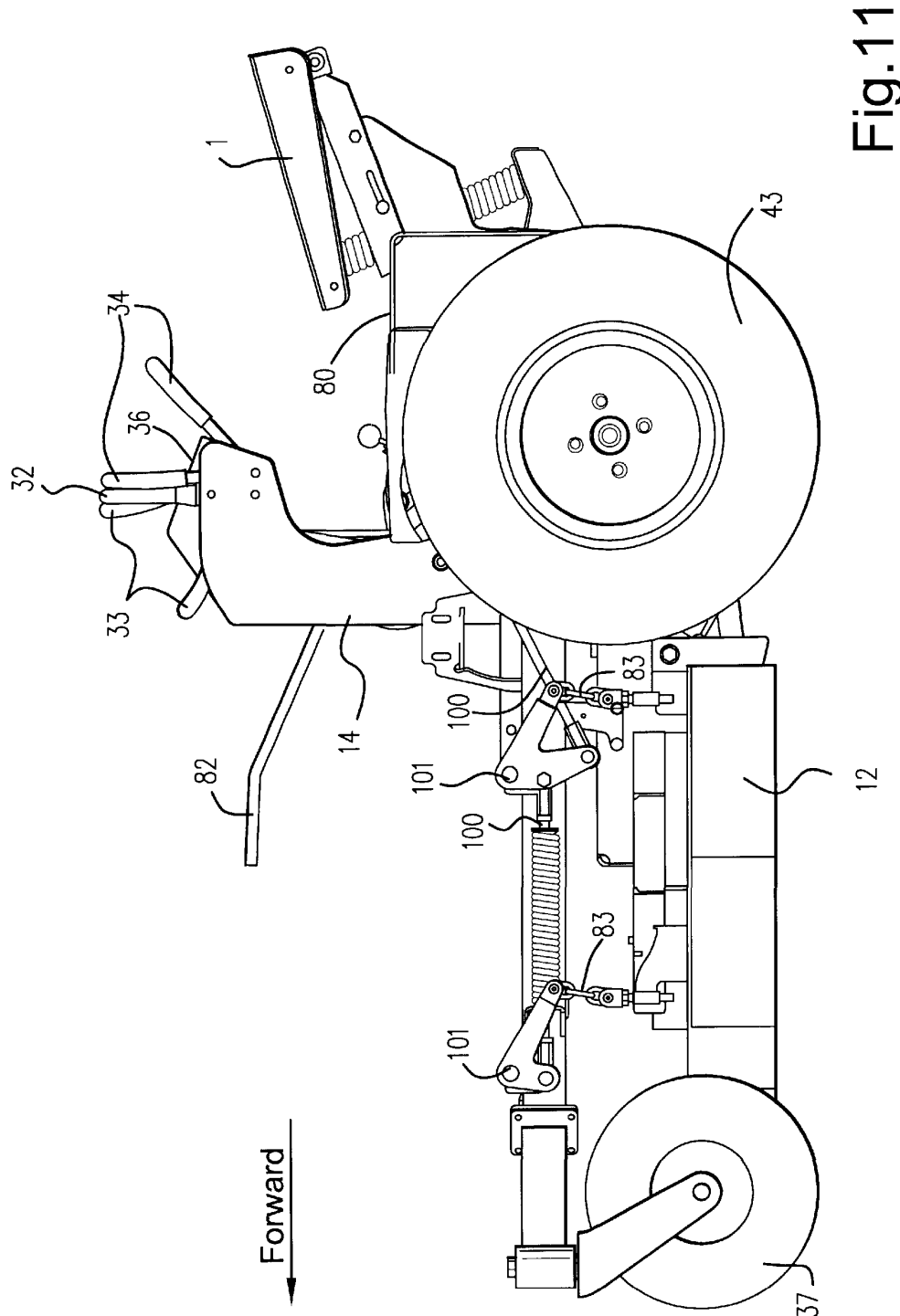


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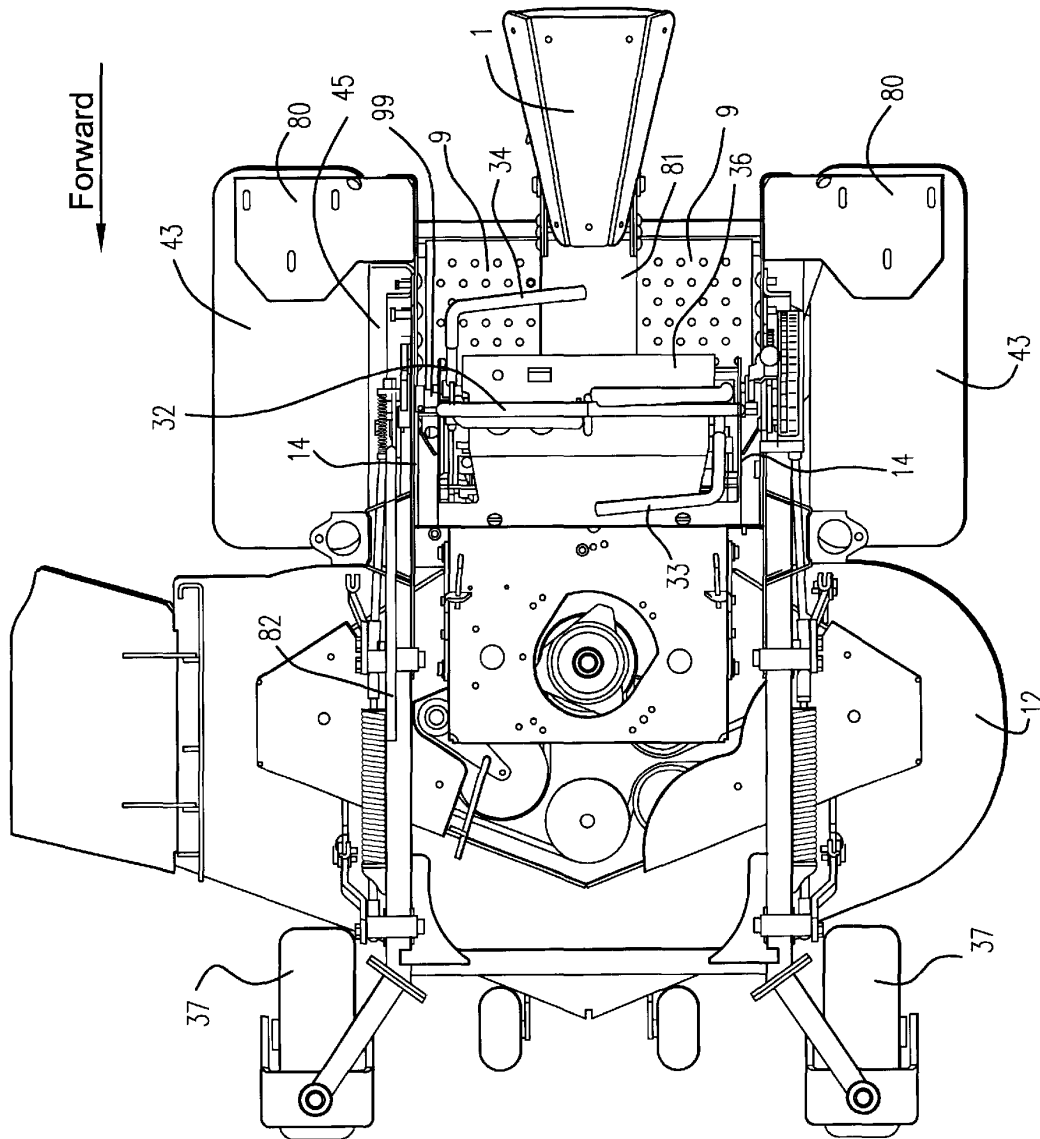
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Fig.12



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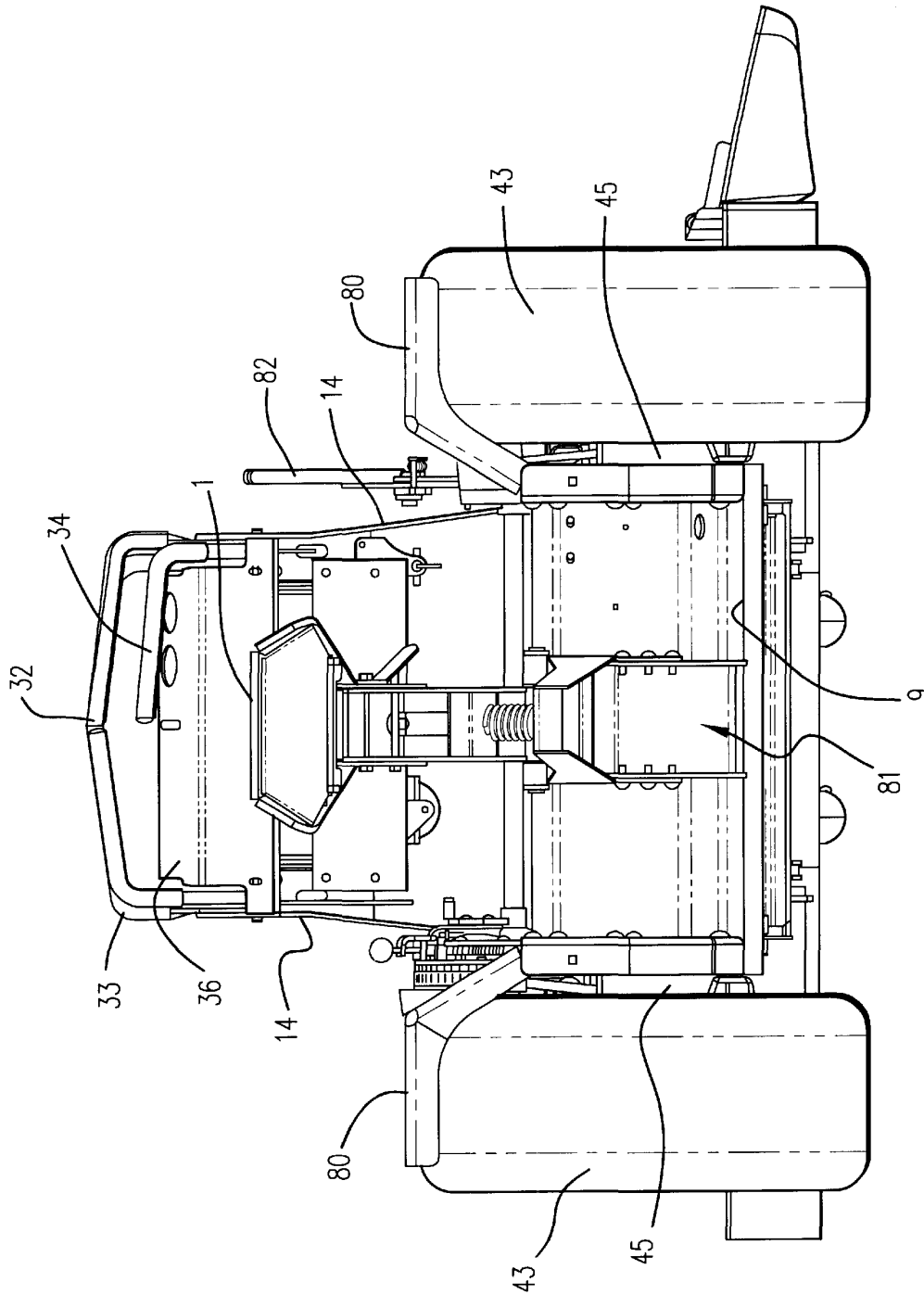


Fig. 13

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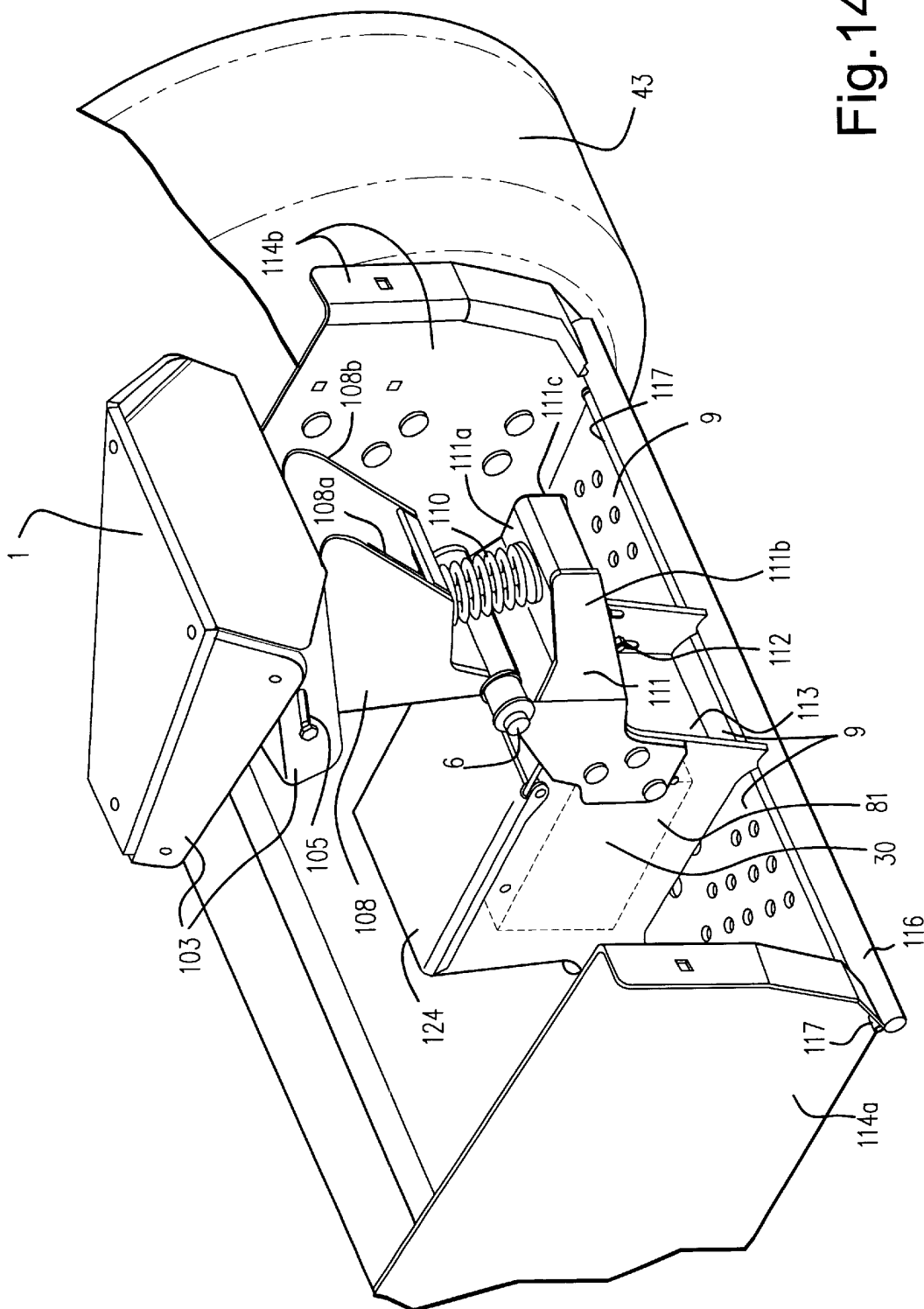


Fig. 14

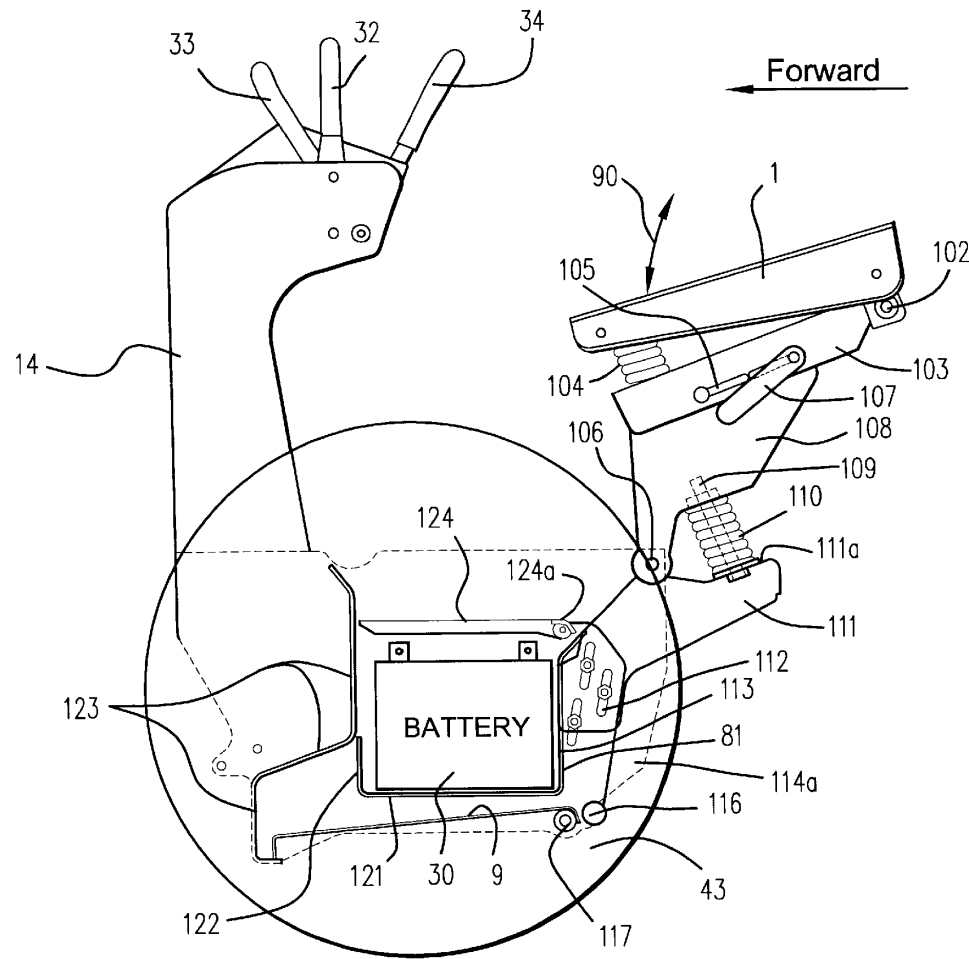


Fig.15

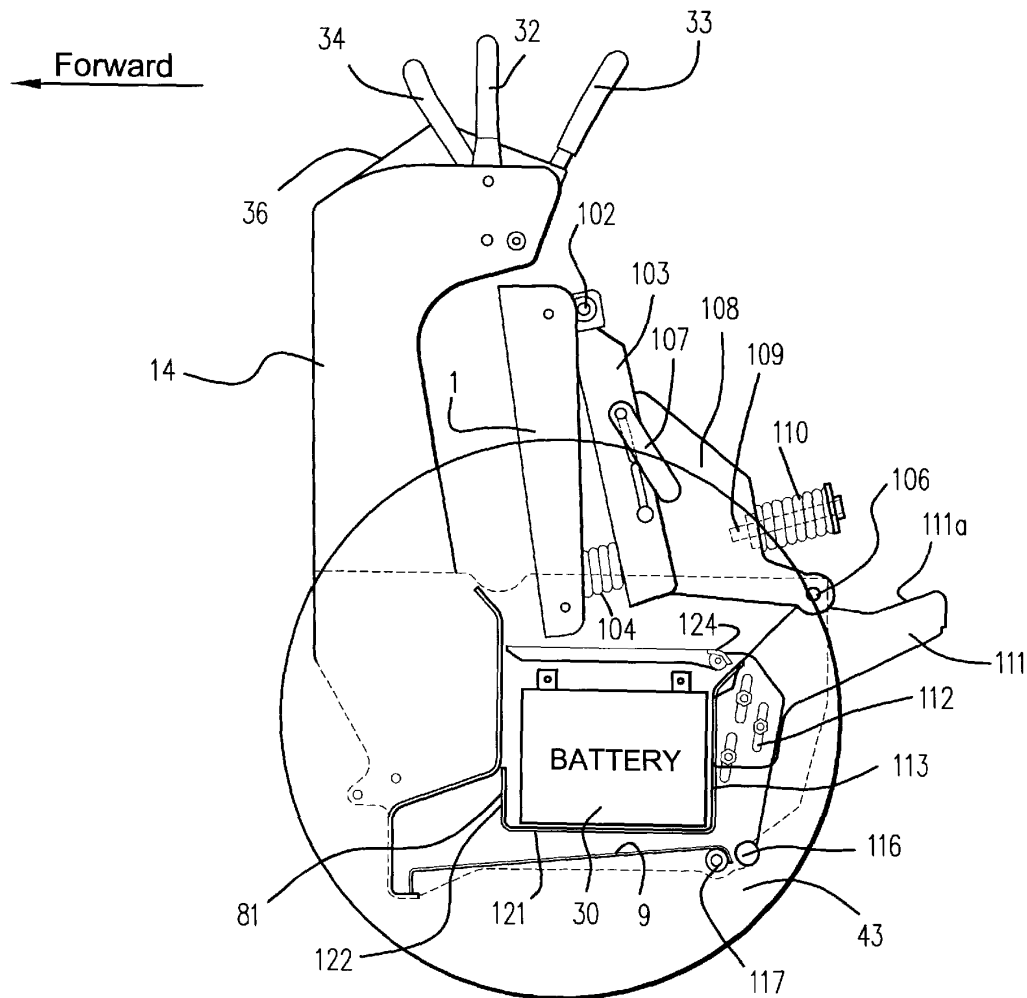


Fig.16

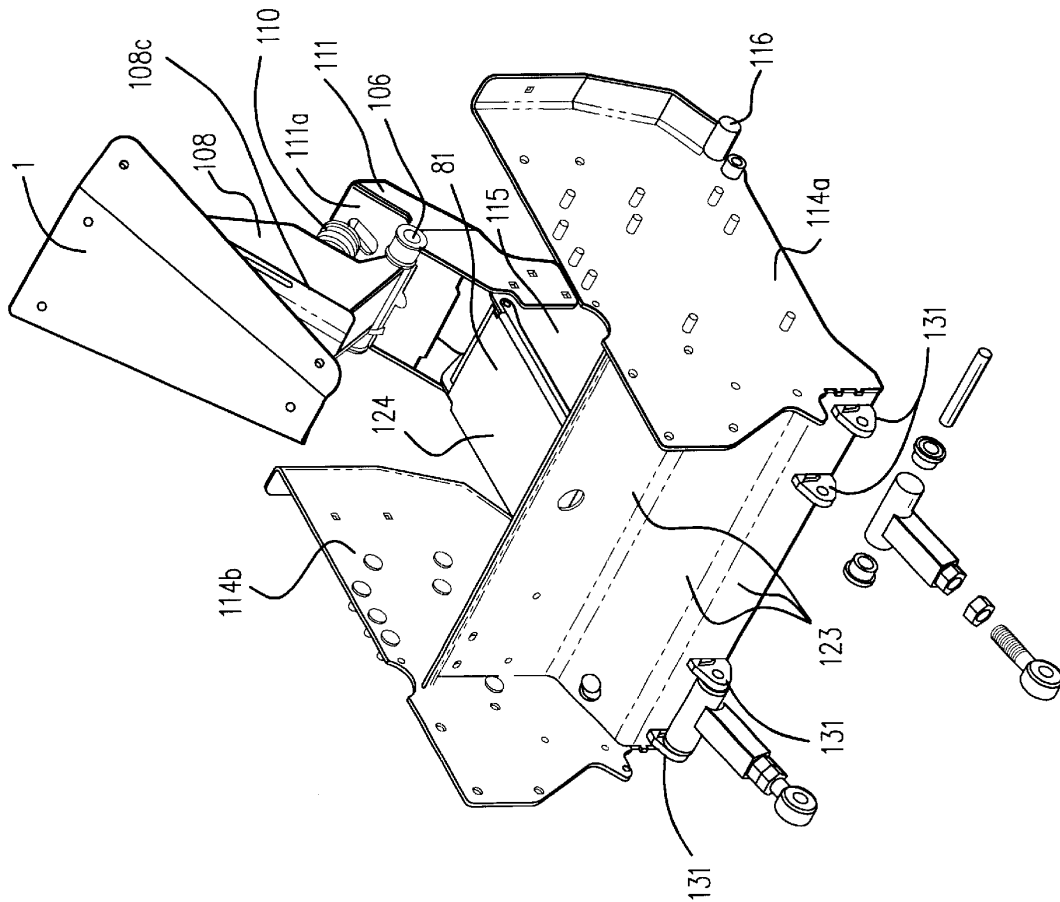
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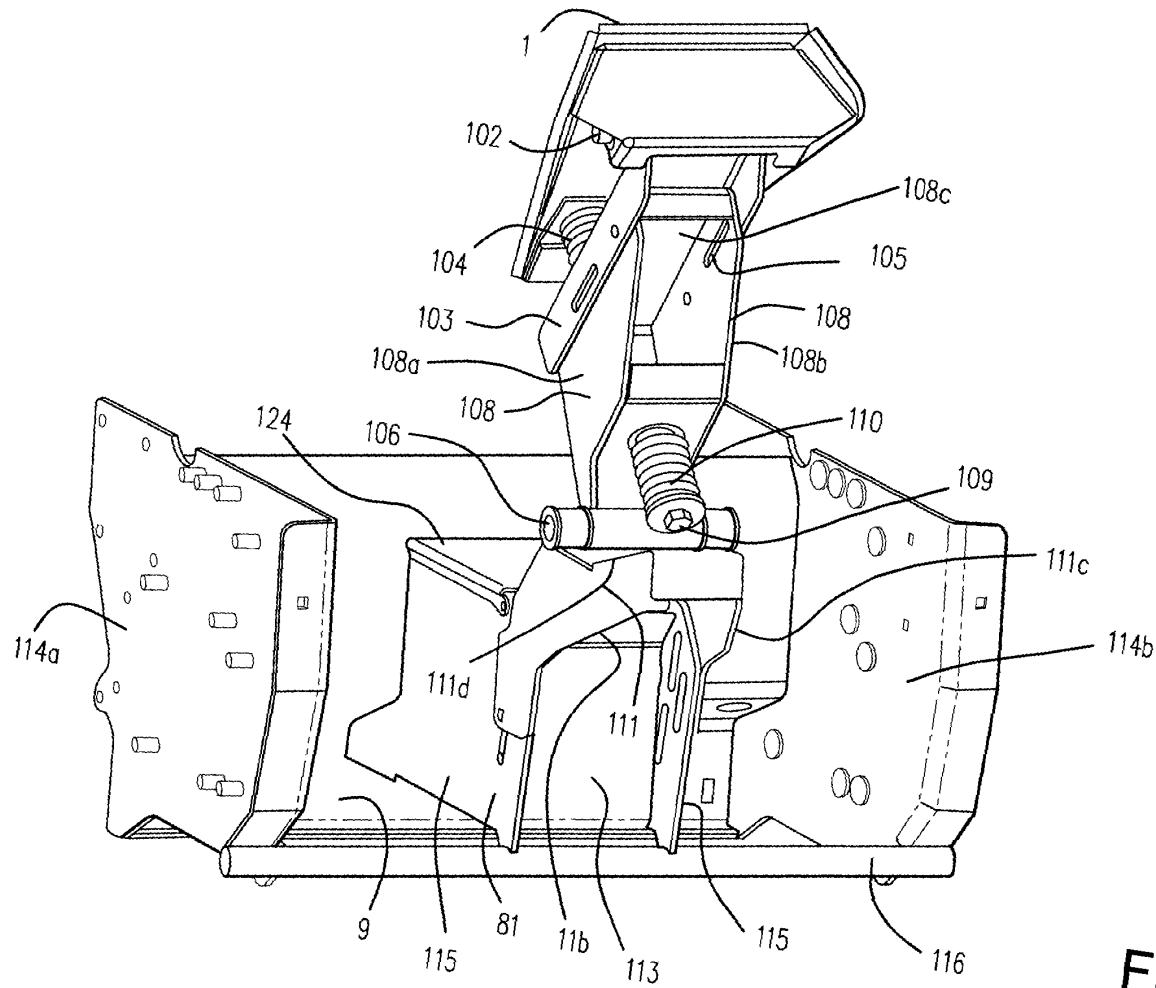
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Fig.17





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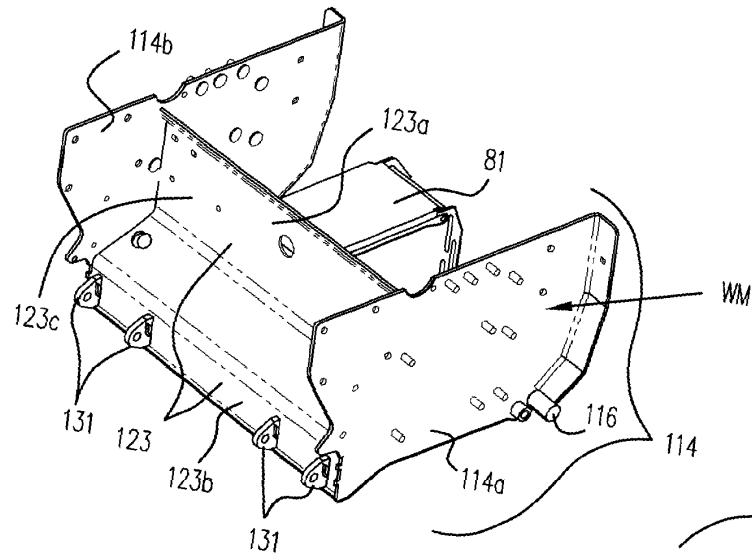


Fig.19

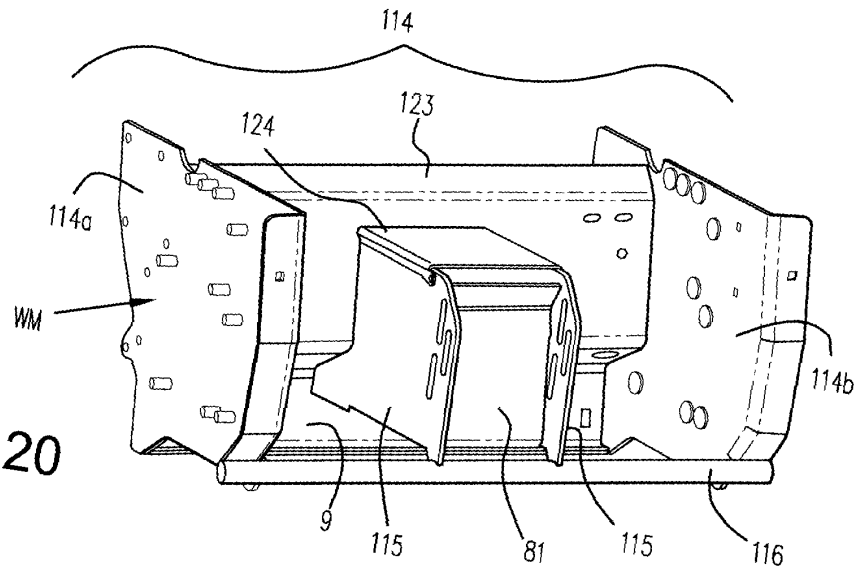


Fig.20

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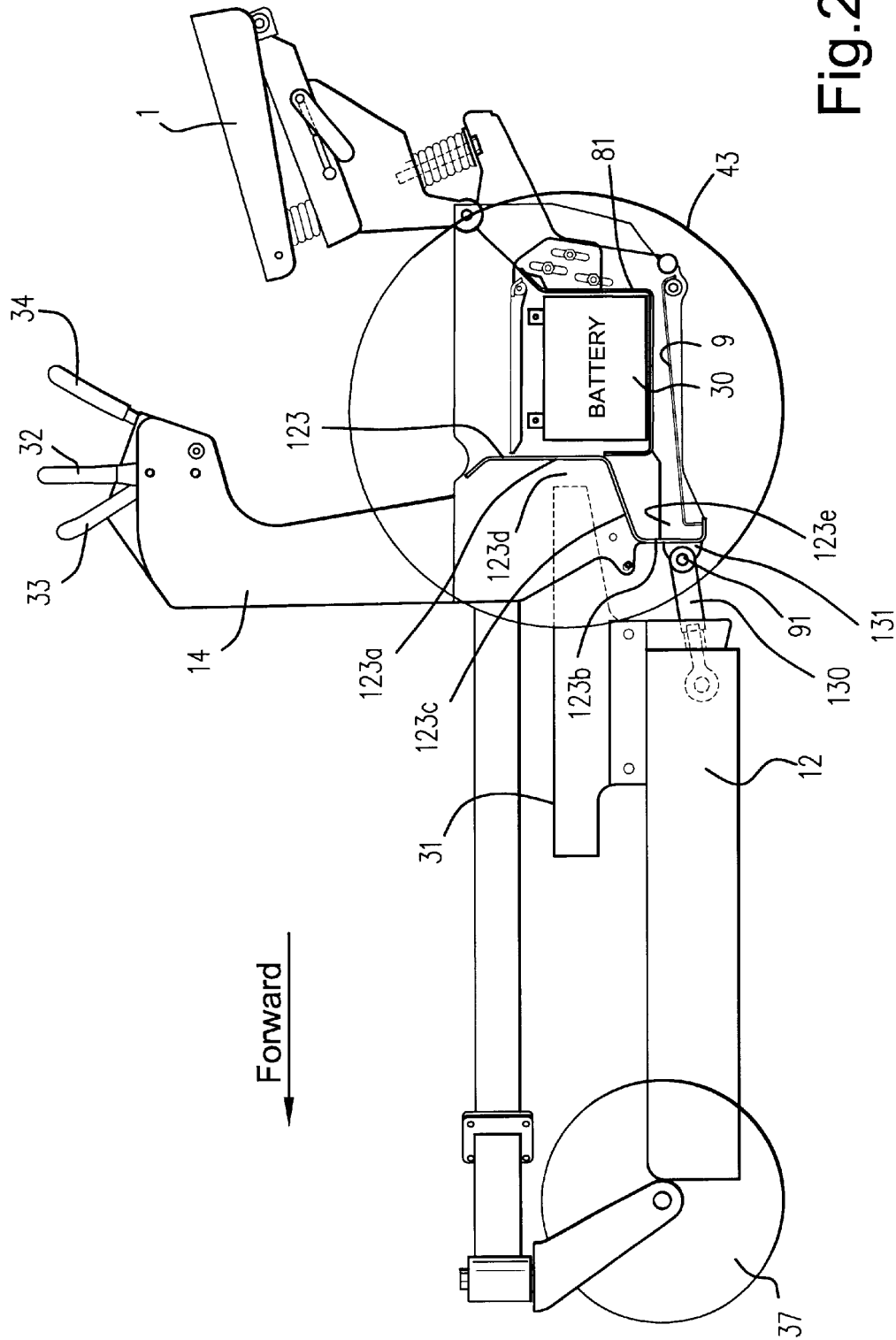


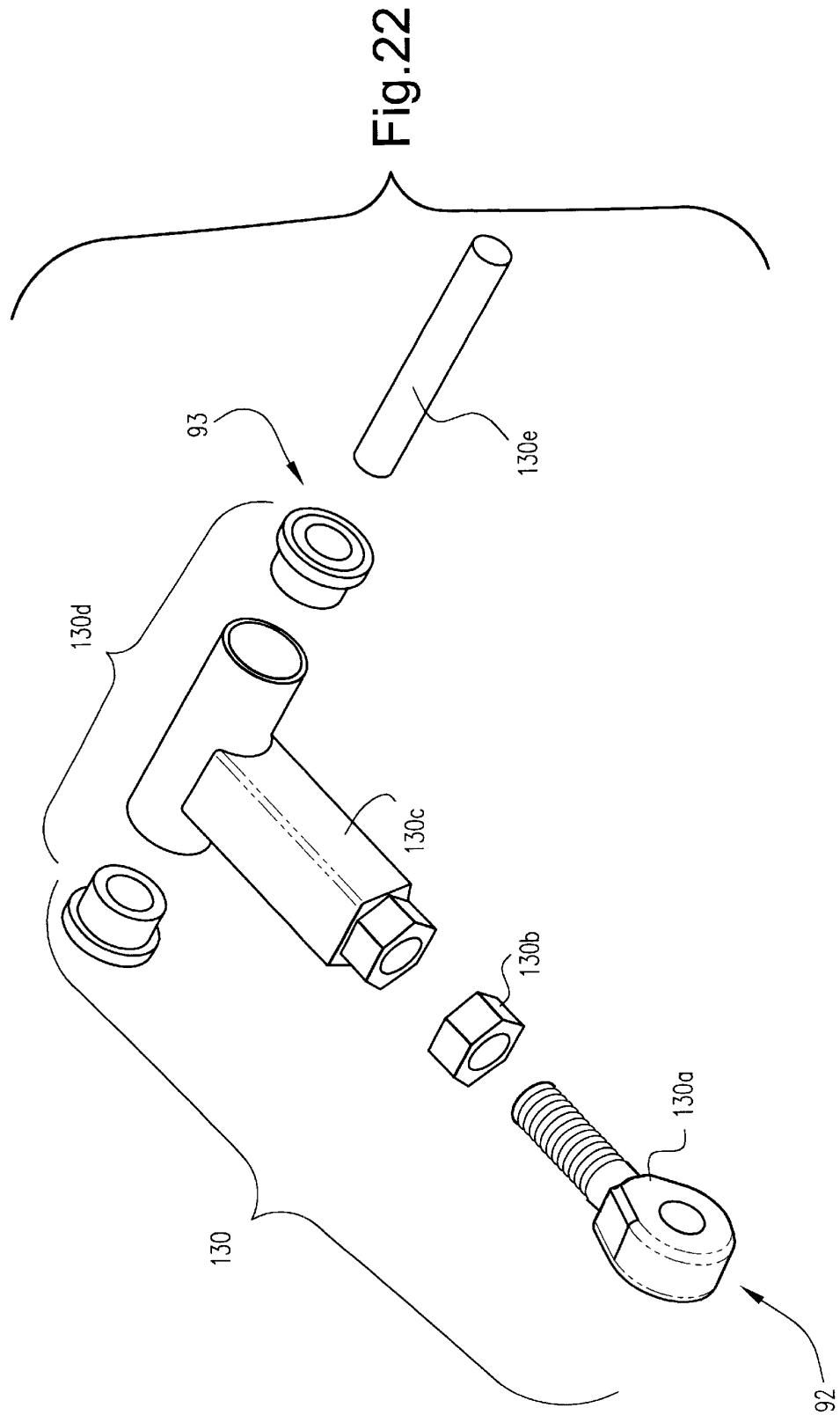
Fig. 21

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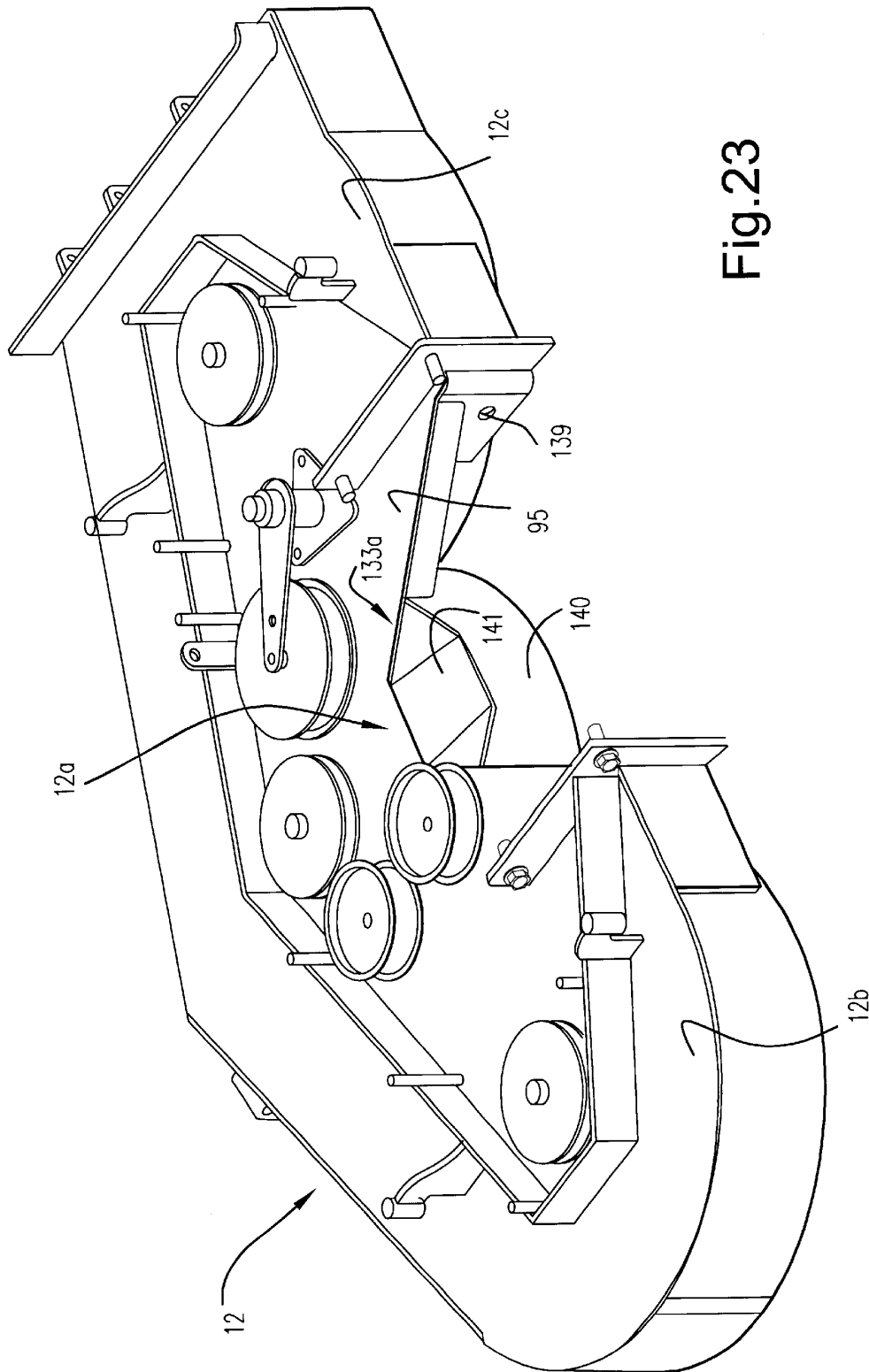


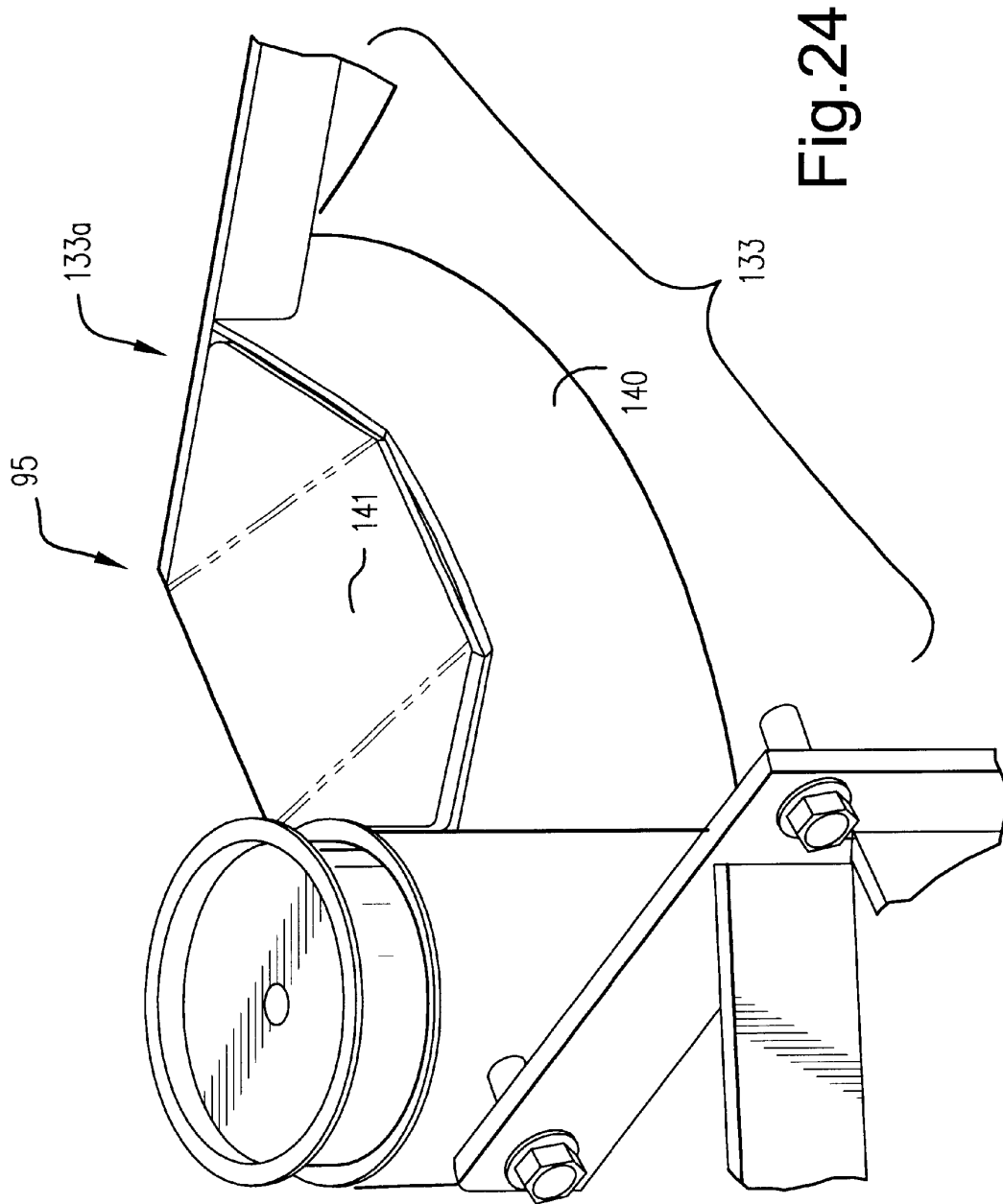
Fig. 23

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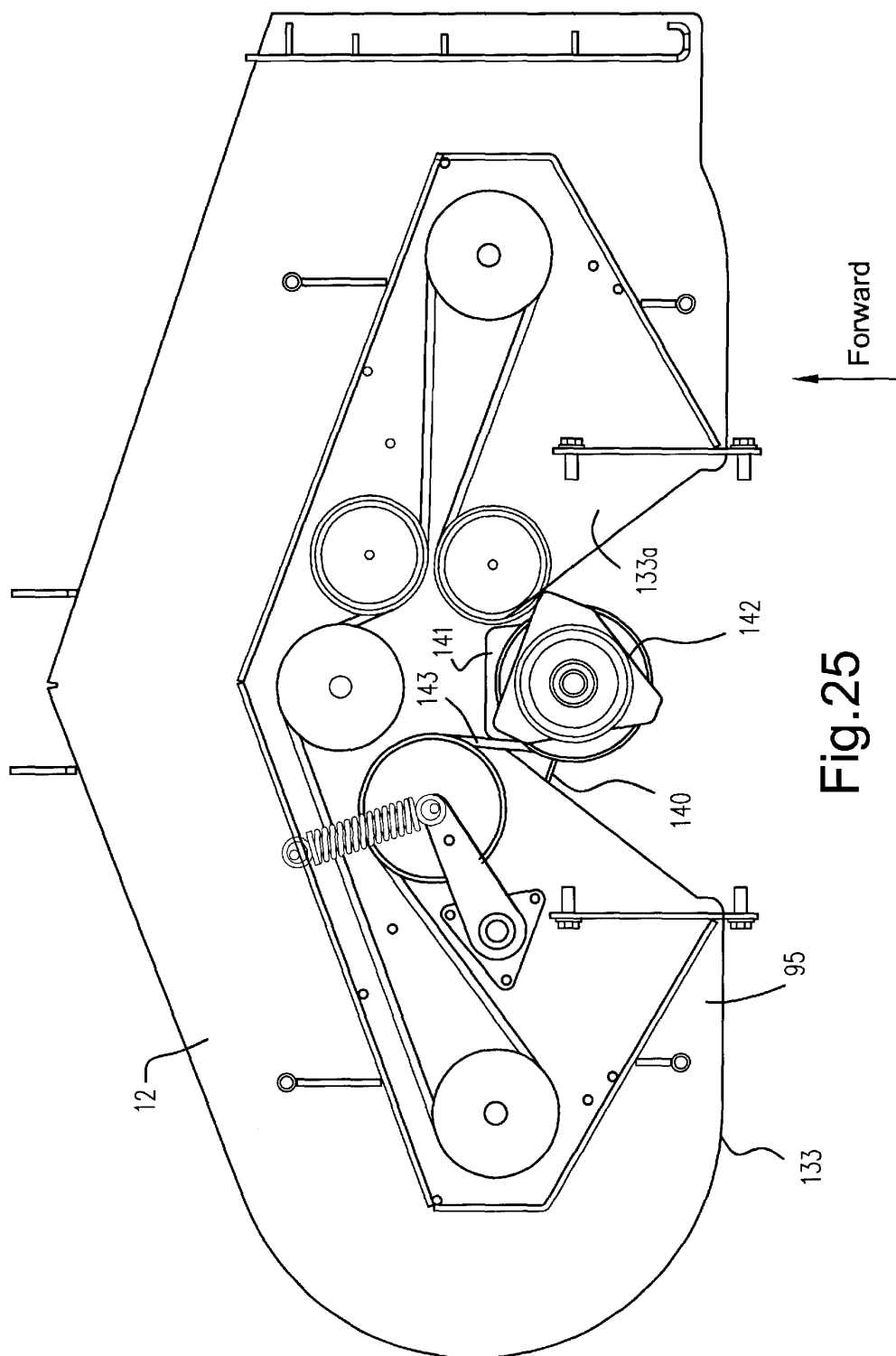


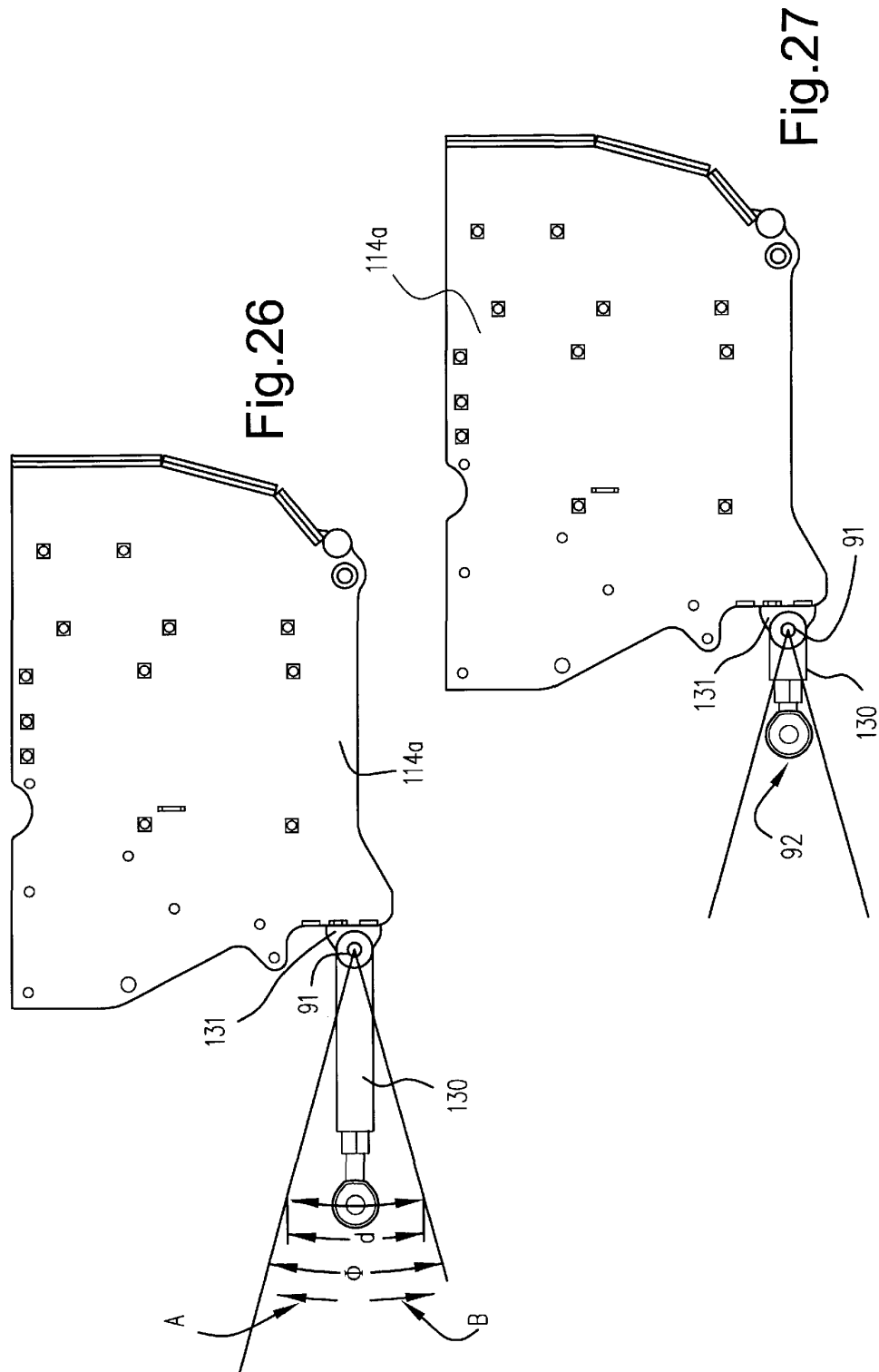
Fig. 25

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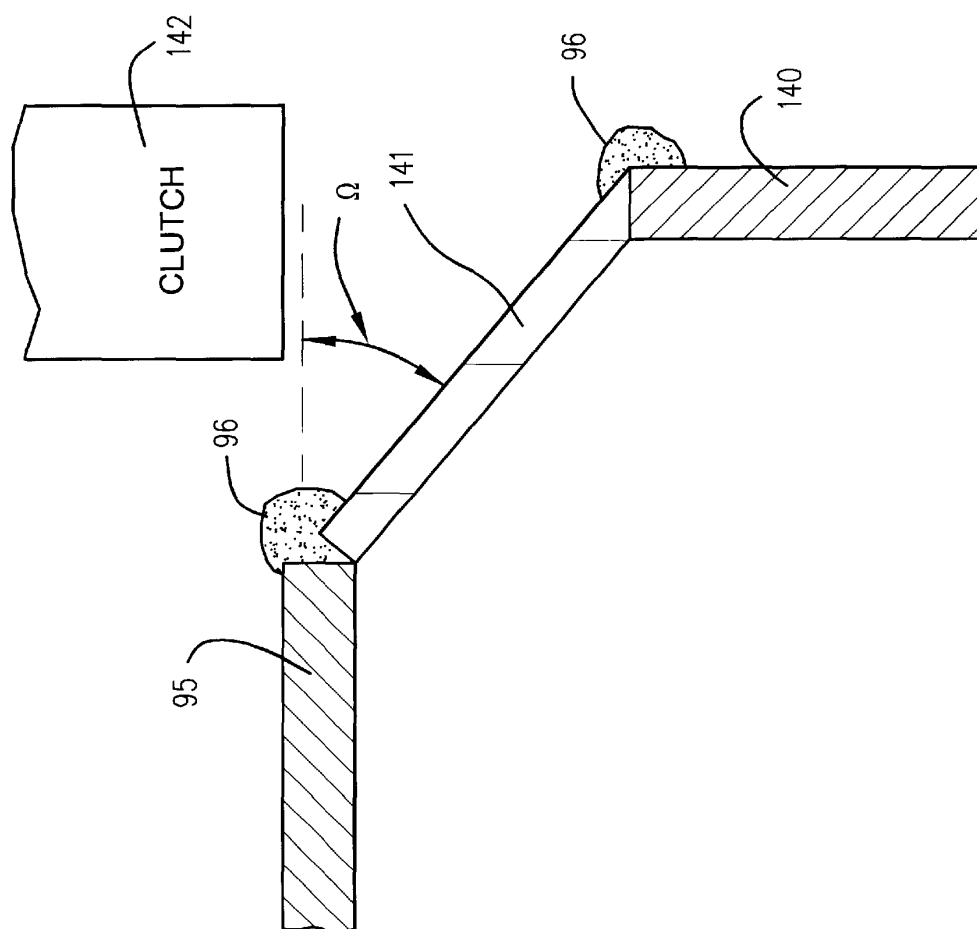


Fig.28

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POWER LAWN MOWER INCLUDING SHORTENED CONTROL ARMS FOR USE IN DECK LIFT SYSTEM

This application is a continuation-in-part (CIP) of U.S. Ser. No. 09/412,589, filed Oct. 5, 1999 now U.S. Pat. No. 6,205,753, the disclosure of which is hereby incorporated herein by reference.

Known commercial power mowers are generally divided into three separate categories: self-propelled walk-behind mowers, ride-on mowers operated by a seated occupant, and stand-on mowers operated by a standing occupant.

For example, U.S. Pat. No. 4,920,733 discloses a typical walk-behind power mower. U.S. Pat. No. 5,865,020 discloses a typical ride-on mower where an operator sits on a seat during mower operation. U.S. Pat. Nos. 5,984,031, 5,964,082 and 5,507,138 disclose known stand-on mowers, each of these three patents hereby being incorporated herein by reference.

Deck lift systems for power mowers are also known in the art. For example, see the cutter deck lift system in U.S. Pat. No. 5,865,020, the disclosure of which is incorporated herein by reference. The mower or cutter deck is supported by a plurality of chains and a deck lift system enables the cutter deck to be raised and lowered in order to adjust the cutting height of the mower. Control arms (e.g., see reference numeral 40 in the '020 patent) are utilized to control the lateral position or location of the cutter deck. Unfortunately, the control arms in the '020 patent are rather long. Long control arms are needed in the '020 system because the engine deck (upon which the engine is mounted behind the seat) does not move up/down along with the cutter deck during cutting height adjustment (i.e., the engine and engine deck remain fixed in place). Thus, the control arms are lengthy in order to reduce the amount of lateral movement of the cutter deck during raising/lowering operations in order to prevent large amounts of slack and/or tightness from building up in the pulley belt(s) which extend between the engine drive shaft and the blade pulleys mounted in top of the cutter deck. Unfortunately, long control arms means that the mower is more susceptible to damage caused by side-loads (e.g., when the side of the cutter deck is hit by something, or runs into an object such as a curb or tree).

Accordingly, it will be apparent to those skilled in the art that there exists a need in the art for a power mower deck lift system that can be designed so as to enable the efficient use of short control arms without overcomplicating the design of the mower. It is an object of this invention to fulfill this and other needs which will become apparent to the skilled artisan from reading the instant disclosure.

SUMMARY OF THE INVENTION

An object of this invention is to provide a deck lift system on a mower wherein control arms can be made short in length so as to make the mower more resistant to damage caused by side-load impact(s) on the cutter deck.

Another object of this invention is to provide a deck lift system on a mower wherein the cutter and engine deck assemblies (including the engine) are raised and lowered together as one unit when adjusting the blade cutting height of the mower.

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Another object of this invention is to provide a power mower where the operator is capable of standing or sitting during different modes of mower operation.

Another object of this invention is to provide a mower where the battery(ies) can be located between feet of an operator in order to lower the overall center of gravity of the mower.

Another object of this invention is to provide a mower designed so that when going up a hill a mower operator can move from a sitting position to a standing position so that the overall center of gravity of the mower can be moved forward to minimize potential for tipping backward.

Another object of this invention is to provide a seat assembly which enables an operator to easily jump off of or abandon the machine.

Another object of this invention is to provide a seat on a mower, where the seat may be folded up into a storage or stowed position when the operator is standing on the mower or when there is a desire to transport or store the mower.

Another object of this invention is to provide a mower including a seat structure which is both comfortable and may be efficiently moved between deployed and non-deployed positions.

Another object of this invention is to provide a deck lift system which lifts an engine deck and a cutter deck together with one another, so that control arms utilized for positioning the deck can be designed to be shorter thereby enabling the deck assembly to be more resistant to negative impacts which may be caused by side-loads.

Yet another object of this invention is to satisfy or fulfill one or more of the above listed ^{objects}.

Certain embodiments of this invention fulfill one or more of the above-listed needs and/or objects by providing a self-propelled power lawn mower comprising:

- first and second rear drive wheels that are independently driveable so as to enable the mower to conduct approximate zero radius turns about a zero radius turning axis;
- a foot platform for supporting at least one foot of an operator of the mower, said foot platform being located at an elevation less than an elevation of a top edge of at least one of said rear drive wheels;

- a deck lift system for raising and lowering a cutter deck assembly, an engine deck, and an engine together as one unit in order to adjust a blade cutting height of the mower;

- control arms pivotally attached to at least one of the cutter deck and engine deck in order to maintain lateral positioning of the cutter deck assembly and engine deck during the raising and lowering; and

- wherein said control arms are short enough in length so that pivoting of the control arms an angle Φ of fifteen (15) degrees either upward or downward during raising or lowering of the cutter deck assembly causes the cutter deck assembly to move a vertical distance "d" no more than about 2.5 inches.

Certain embodiments of this invention further fulfill one or more of the above-listed needs and/or objects by providing a self-propelled power lawn mower comprising:

- at least one drive wheel;
- a cutter deck assembly;
- an engine;

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a deck lift system for raising and lowering the cutter deck assembly and engine together in order to adjust a blade cutting height of the mower; and
 pivoting control arms for helping maintain lateral positioning of the cutter deck assembly and engine during the raising and lowering.

IN THE DRAWINGS

FIG. 1 is a side elevation view of a zero radius turning self-propelled power lawn mower according to a first embodiment of this invention, the mower including both standing and sitting modes and this Figure showing the operator in a sitting position.

FIG. 2 is a side elevational view of the power mower of FIG. 1, showing the operator in a standing position on a foot platform.

FIG. 3 is a side elevational view of the power mower of FIGS. 1-2, without an operator and showing the seat in a folded-up or stowed position.

FIG. 4 is a side elevational view of the power mower of FIGS. 1-3, showing an operator getting on or off of the mower, wherein the seat is pivoted about a pivot as the operator moves forward or rearward.

FIG. 5 is a side elevational view of a zero radius turning self-propelled power mower according to a second embodiment of this invention, the mower including both standing and sitting modes and this Figure showing the operator in a sitting position.

FIG. 6 is a side elevation view of the mower of FIG. 5, showing the seat folded up absent an operator.

FIG. 7 is a side elevation view of a zero radius turning self-propelled power mower according to a third embodiment of this invention, the mower including both standing and sitting modes, as well as control cables; this Figure showing the operator in a sitting position.

FIG. 8 is a rear elevational view of the mower of FIGS. 1-4, absent an operator.

FIG. 9 is a perspective view of a zero radius turning self-propelled power mower according to a fourth embodiment of this invention, the mower including both standing and sitting modes; this figure illustrating the seat in a deployed position.

FIG. 10 is a perspective view of the power mower of FIG. 9, again illustrating the seat in a deployed position.

FIG. 11 is a side elevation view of the mower of FIG. 9-10, showing the seat in a deployed position.

FIG. 12 is a top view of the mower of FIGS. 9-11.

FIG. 13 is a rear elevation view of the mower of FIGS. 9-12.

FIG. 14 is a perspective view of the seat assembly or structure of the mower of FIGS. 9-13.

FIG. 15 is a side view of certain elements of the seat structure of the mower of FIGS. 9-14, illustrating the seat in a deployed position.

FIG. 16 is a side view of certain elements of the seat structure of the mower of FIGS. 9-15, showing the seat in a folded-up or non-deployed (i.e., stowed) position.

FIG. 17 is a perspective view of the seat structure attached to the tractor frame of the mower of FIGS. 9-16.

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FIG. 18 is a perspective view illustrating the seat structure attached to the tractor frame of the mower of FIGS. 9-17.

FIG. 19 is a perspective view of the tractor frame of the mower of FIGS. 9-18.

FIG. 20 is another perspective view of the tractor frame of the mower of FIGS. 9-19.

FIG. 21 is a side plan view of certain components of the mower of FIGS. 9-20, specifically illustrating the control arms which function to position the cutter and engine decks as they are moved upward and/or downward by the deck lift system (e.g., this figure shows the rear of the engine deck over top of the toe area of the operator).

FIG. 22 is an exploded perspective view of an exemplary control arm of the mower of FIGS. 9-21.

FIG. 23 is a perspective view from above and behind, illustrating the cutter deck assembly with blade drive pulleys thereon, of the mower of FIGS. 9-22.

FIG. 24 is a close up perspective view of a portion of the cutter deck assembly of FIG. 23.

FIG. 25 is a top view illustrating a clutch and pulley system used in conjunction with the cutter deck assembly of FIGS. 23-24.

FIG. 26 is a schematic side view illustrating a control arm and its pivot ranges as it extends from the tractor frame according to one possible embodiment for use in conjunction with the FIGS. 9-25 embodiment of this invention.

FIG. 27 is a schematic side view illustrating a control arm and its pivot ranges as it extends from the tractor frame according to another possible embodiment for use in conjunction with the FIGS. 9-25 embodiment of this invention.

FIG. 28 is a side cross sectional view of a portion of the cutter deck assembly of FIGS. 23-24.

DETAILED DESCRIPTION OF CERTAIN EMBODIMENTS OF THIS INVENTION

Referring now more particularly to the accompanying drawings in which like reference numerals indicate like parts throughout the several views.

FIGS. 1-4 and 8 illustrate a zero radius turning self-propelled power lawn mower according to a first embodiment of this invention. Operator 41 of the mower may use the mower either when sitting down on the seat or alternatively when standing up on the foot platform. In other alternative embodiments of this invention, the mower may be used primarily as a sit-down mower, or primarily as a stand-on mower.

Referring to FIGS. 1-4 and 8, the lawn mower includes: operator seat 1 for the operator to sit on during mower operation; seat pivot axis 2 about which seat 1 pivots or rotates; spring(s) or shock absorber(s) 3 for dampening the front of the seat for operator comfort; seat support or frame 4; wheelie roller(s) 5; pivot axis 6 for enabling seat support 4 to fold up along with the seat; spring(s) or shock absorber(s) 7 for dampening the rear of the seat for operator comfort; upwardly extending spaced apart and parallel supports or frames 8 provided between the operator's legs for supporting seat support 4 and for housing battery 30 or tools therebetween; stationary or pivotable foot platform 9 on which the operator may stand during mower operation; latch

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10 for preventing seat 1 from folding up unexpectedly; engine frame weldment 11 connected to cutter or mower deck assembly 12 within which the cutting blades are provided; frame 13 for suspending or supporting cutter deck assembly 12 and/or engine frame weldment 11; engine deck 31 defining a plane upon which a pair of hydraulic or hydrostatic pumps 22 and the engine are mounted; a pair of laterally spaced side plates 14 extending upwardly from engine deck 31 or frame in order to support (directly or indirectly) at least (1) normally stationary handlebar 32, (2) a pair of spaced apart pivotable front handle grips 33 and a pair of spaced apart rear handle grips 34 (see U.S. Pat. No. 5,809,755, incorporated herein by reference), (3) hydraulic oil tank 35, (4) a pair of spaced apart arm rests 17 which may be padded, (5) a pair of arm rest support brackets 15, (6) corresponding arm rests pivots 16 for enabling the arm rests to fold up out of the way so that a standing operator can stand on either side of the platform without substantial interference from an arm rest, (7) pivot stop 18 for arm rest supports 15 to come to rest against when in a deployed position so as to support the arm rests, and (8) dashboard or console 36 including an hour gage (not shown); a pair of front casters or wheels 37 supported by frame 13 or alternatively by the cutter deck assembly 12; combustion engine 38 mounted on the plane of engine deck 31; engine shaft 39 extending from the engine downwardly through an aperture in the engine deck 31 for driving the cutter blades via belts and pulleys 40; operator 41 who may operate the mower either while seating on seat 1 as shown in FIG. 1 or when standing on platform 9 as shown in FIG. 2; control arms 42 which enable cutter deck 12 and engine deck 31 to move up and down relative to frame 13 and dampen movement therebetween; a pair of independently drivable rear drive wheels 43 which rotate about a common rear drive wheel axis 44; and right and left hand hydrostatically controlled rear drive wheel motors 45 (see FIG. 8) whose wheel driving direction and speed are controlled by pumps 22 via pivoting handle controls 33 and/or 34 as described in U.S. Pat. No. 5,809,755 which is incorporated herein by reference.

In certain embodiments of this invention, engine 38 is moved forward relative to certain conventional mowers so that drive shaft 39 thereof is located forward of the front edge of rear drive wheels 43 and also forward of the front edge of supports 14. Moreover, in certain embodiments, the entire engine 38 is located forward of the front edge of rear drive wheels 43. This forward positioning of the engine permits additional weight to be provided closer to the front of the mower in order to offset weight distributed by the operator when on seat 1.

The location, function, and structure of platform 9, hydro pumps 22, and wheel motors may be as shown and/or described in any of U.S. Pat. Nos. 5,765,357 or 5,809,755, both of which are hereby incorporated herein by reference.

Still referring to FIGS. 1-4 and 8, the left rear drive wheel may be driven in a forward direction by one motor 45 while simultaneously the right rear drive wheel is driven in a rearward direction by the other motor 45 at approximately the same speed so that the mower conducts an approximate zero radius turn about a vertical zero radius turning axis 65 that is spaced equal distance between the rear wheels 43 and extends upwardly through common rear wheel axis 44. Left

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hand pump 22 is in fluid communication with the left wheel motor 45 so that the drive direction and speed of left drive wheel 43 are controlled by pivoting left hand controls or levers 33 and 34; while right hand pump 22 is in fluid communication with right wheel motor 45 so that the drive direction and speed of right drive wheel 43 are controlled by pivoting right hand controls or levers 33 and 34. The right and left rear drive wheels 43 are thus controlled independently from one another in certain embodiments of this invention. Each rear drive wheel is preferably mounted on its own drive axle, and the axle of one wheel 43 may be part of the corresponding wheel motor 45 or alternatively may be separate from the motor. The same is true for the axle of the other rear drive wheel 43. In alternative non-zero radius turning embodiments, both rear drive wheels may be mounted on a single supporting axle.

In zero radius turning embodiments herein, at least a portion of foot platform 9 may be positioned so that the operator when standing on the platform is substantially unaffected by centrifugal force during zero radius turns of the mower. In certain embodiments, platform 9 may be positioned so that it is intersected by zero radius turning axis 65. In other embodiments, platform 9 is positioned relative to handle grips 32-34 so that the operator when standing on platform 9 and gripping a portion of the handle control assembly is substantially unaffected by centrifugal force created during approximate zero radius turns of the mower and at least a portion of his or her body may be on or near (e.g., within six inches of) the vertical turning axis 65. In certain embodiments, handle grips 32-34 are located forward of the vertical turning axis 65 and the platform rearward thereof so that the operator when standing on platform 9 is substantially unaffected by centrifugal force created during zero radius turns of the mower. In any of the above embodiments, at least a portion (or in some embodiments a substantial portion such as a thigh, head, torso, shoulder, chest, stomach, or the like) of the standing operator's body may be substantially at or near the vertical zero radius turning axis 65 during mower operations such as turning, going up hills, or during flat terrain operation.

In certain zero radius turning embodiments, hydrostatic pumps 22 are in conventional communication with hydrostatic motors 45 by way of, for example, a plurality of hydraulic fluid hoses (not shown) disposed between each pump and corresponding mower. Pumps 22 including known swash plates (not shown) generate hydraulic fluid pressure which is translated through one of two hoses connecting each pump 22 to a corresponding motor 45. The hydraulic hoses are coupled between each pump 22 and its motor 45 so as to allow hydraulic fluid to flow in both directions between each pump and its motor. One hydraulic hose may be provided for allowing hydraulic fluid to flow in one direction and another hose for permitting the fluid to flow in the opposite direction between a motor 45 and its corresponding pump 22. Each pump 22 includes a conventional pump control lever (not shown) extending therefrom for permitting the standing or sitting operator to control the speed and forward/reverse sense of each rear drive wheel via a hand lever(s) 33-34. Hydraulic pumps 22 may be driven by engine 38 via belts or any other suitable means. Alternatively, rear drive wheels 43 could instead be driven

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by chains or gears in a known manner, or by any other suitable variable speed devices.

Still referring to FIGS. 1-4 and 8, seat 1 may include an approximately upright section 1a as well as an approximately horizontal section 1b, so that seat 1 may be approximately L-shaped. The operator sits on portion 1b and may lean backwards against section 1a. As illustrated, seat 1 in certain embodiments is positioned entirely behind the zero radius turning axis 65 which extends upwardly through horizontal wheel axis 44. However, grip portions 32-34 of the handle control assembly may be located forward of axis 65 so that at least a portion of the operator's body can be on or near this turning axis 65 during sitting and/or standing operation of the mower. As shown in this particular embodiment, when in their deployed positions arm rests 17 are located behind vertical turning axis 65. However, in other embodiments arm rests 17 may be located on or forward of axis 65 depending on the preference of the operator or mower designer.

When the operator operates the mower when sitting on seat 1, the center of gravity of the combination of mower and operator is further rearward than when the operator is standing on platform 9. This is because the platform is located forward of the seat (preferably, a substantial portion of the platform is located forward of the front edge of the seat).

Seat 1 is designed so that seat portion 1b is elongated in forward and/or rearward directions. Therefore, the operator can adjust the position of his/her weight on the seat at various positions thereby causing the mower's center of gravity to move forward and/or rearward during operation. For example, the operator may sit on the middle of seat 1 during operation of the mower on flat terrain. However, when going down a hill, the operator may slide further back on seat 1 in order to put as much weight as possible on the rear drive wheels 43 to increase traction on the rear tires by offsetting front end weight when going down a hill. When mowing up hills, the operator may move from a sitting position to a standing position on platform 9 and lean forward over the handle control assembly in order to put additional weight on the front of the mower thereby reducing the potential of tipping rearwardly when going up hills. Alternatively, when going up a hill the operator may simply slide or move forward on the seat 1.

Springs or shock absorbers 3 and 7 are optionally associated with seat 1 and are provided for operator comfort during sitting modes. At least one spring or other biasing means 3 is positioned proximate and below a front portion of seat 1 to dampen vibration or movement of the front of the seat during mower operation. Spring(s) 3 is generally oriented in a vertical manner with its biasing axis being approximately vertical with respect to flat ground on which the mower travels. Meanwhile, at least one spring or other biasing means 7 is provided for dampening movement of a rear portion of seat 1. Spring 7 is oriented at an angle θ of from about 20°-90° (most preferably from about 30°-60°) relative to the vertical and thus relative to the axis of spring 3. Seat 1 is mounted on seat support 4. Support 4 and seat 1 may rotate or pivot together about fixed axis 6. Thus, when substantial weight is placed on the rear portion of seat 1, the seat together with support 4 tend to rotate in a counterclock-

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wise direction as defined in FIG. 2 about axis 6. Spring(s) 7 biases support 4 and thus seat 1 against too much counterclockwise tendency, thereby dampening vibration felt by the operator during seated operation of the mower.

Seat 1 may be folded up in certain embodiments in order to shorten the length of the mower for transport and/or storage (or for the operator to operate the mower when standing). For example, seat 1 may be folded up from its deployed position (see FIGS. 1-2) to a non-deployed or stowed position (see FIG. 3). To do this, seat 1 together with support 4 is/are rotated clockwise about fixed pivot axis 6 from the FIG. 1-2 position to the folded-up FIG. 3 position (i.e., to the stowed position). In preferred embodiments, pivot axis 6 is positioned forward of the rear edge of rear drive wheels 43 but rearward of common horizontal wheel axis 44 so that the seat assembly when folded upwardly provides for a more compact mower. Optionally, pivot latch 10 may be provided so that the seat assembly cannot be folded up unexpectedly. Alternatively, no pivot latch 10 need be provided in certain embodiments.

Optionally, an operator presence control (OPC) switch may be associated with platform 9 in certain embodiments of this invention. Such an OPC switch may cause the mower and/or blades to turn off when the operator leaves or steps off of the platform in certain embodiments. An exemplary OPC switch associated with the platform is disclosed and described in U.S. Pat. No. 5,809,755, incorporated herein by reference. Alternatively, in other embodiments, a similar OPC switch may be associated with the handle control assembly so that the mower engine and/or blades shut off if and when the operator's hands are removed from the handle control assembly during operation. It is preferred that the mower not be equipped with a single OPC switch associated with only the seat, due to the need for potential standing operation during certain conditions (although, in certain alternative embodiments an OPC switch associated only with the seat may be utilized).

The seat assembly of the mower of FIGS. 1-4 and 8 is designed so that it is easy for an operator 41 to get off of or onto the mower. FIG. 4 illustrates an operator either getting onto or off of the mower by allowing seat 1 to pivot about axis 2 as the operator moves either forward or rearward. For example, assuming that the operator 41 is getting on the mower as shown in FIG. 4, operator 41 straddles portion 1a of the seat with his/her legs, and as the operator moves forward he/she contacts and pushes downward on portion 1b of the seat so that as the operator sits down the seat 1 rotates clockwise about pivot axis 2 until it reaches the FIG. 1-2 position. Thus, the operator does not have to crawl over an entire seat assembly in order to get on the mower. Such a pivoting seat is optional and need not be provided in all embodiments of this invention.

Still referring to FIG. 4, when an operator 41 desires to get off of the mower from a seated position, the operator 41 may simply push his/her back rearwardly against the top of section 1a of the seat thereby causing the seat to rotate counterclockwise about pivot axis 2 into its FIG. 4 position as the operator rearwardly leaves the mower. This enables the operator to get off of the mower without having to crawl over top of a fixed seat assembly.

As shown in FIG. 4, approximately horizontal pivot axis 2 may be positioned at an elevation at or above the surface

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of seat section **1b** and axis **6** during normal mower operation (see FIGS. **1–2**). Such a positioning of axis **2** makes it less likely for seat **1** to be pivoted counterclockwise about axis **2** unintentionally or accidentally. It is also noted that the two optional arm rests **17** are supported and connected to side supports **14** (instead of the seat) so that the arm rests need not interfere with an operator getting on or off of the mower. In alternative embodiments, the optional arm rests may be supported by the seat itself or any other suitable structure.

The first and second laterally spaced side supports **14** are attached to and extend upwardly from the plane of engine deck **31**. In such embodiments, control rods operatively connected to pivoting levers **33–34** may be utilized and extend between the levers and corresponding pumps **22** in order to control rear drive wheel direction and/or speed.

FIG. **7** illustrates another embodiment of this invention, wherein first and second elongated flexible control cables **61** replace the above-described control rods. First and second similar cables **61** extend between levers **33–34** and the corresponding pumps **22**, thereby allowing pivoting movement of levers **33–34** to control the speed and/or drive direction of rear drive wheels **43**. Cables **61** are preferred in the FIG. **7** embodiment, because the elevation of the engine deck **31**, cutter deck assembly **12**, and pumps **22** is/are adjustable upwardly and downwardly relative to the height of the handle control assembly **32–34**. This is because the engine deck upon which engine **38** and pumps **22** are mounted is suspended from frame **13** and is adjustable upwardly and downwardly along with cutter deck **12** relative to the frame **13** in order to adjust the cutting height of the mower. In the FIG. **7** embodiment, no arm rests are provided.

Cables **61** of the FIG. **7** embodiment are push/pull type cables which act similar to flexible rods and are resistant to buckling. When cables **61** are pushed forward or downward by forward pivoting of lever **34** and/or lever **33**, this causes a pushing force to be applied to pump **22** in a direction going toward the rear of the mower as shown in FIG. **7**. Cables **61** are preferred when the handle control assembly is mounted at an elevation independent from and variable relative to the height of the engine deck **31** and pumps **22**. However, cables **61** need not be utilized in all such embodiments.

FIGS. **5–6** illustrate a self-propelled zero radius turning mower according to yet another embodiment of this invention. The FIGS. **5–6** embodiment differs from the FIGS. **1–4** and **8** embodiment in that in FIGS. **5–6** the seat **1** is generally flat and does not have a back portion. FIG. **5** illustrates seat **1** in a deployed position with the operator sitting on the mower. FIG. **6** illustrates seat **1** in a folded up position or stowed position, with seat **1** and support **4** having been rotated clockwise about pivot axis **6**. In certain embodiments herein, pad or cushion **71** may be mounted on a rear surface or edge of side supports **14** so as to cushion the knees of the operator against banging into supports **14** during riding and/or sitting operation of the mower, and/or to provide a rest up against which seat **1** can contact in a stowed position.

FIGS. **9–25** illustrate a zero radius turning self-propelled power lawn mower according to a fourth embodiment of this invention. This mower includes first and second hydro pumps for controlling first and second corresponding wheel motors, so that the first and second rear drive wheels **43** may

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be driven independently in order to conduct zero radius turns as discussed above. Referring to FIGS. **9–13**, the mower includes: independently drivable rear drive wheels **43**; cutter deck assembly **12** below which the cutting blades cut grass; front caster wheels **37**; foot platform **9**; seat **1**; gas tank supports **80** for supporting respective gas tanks; battery housing structure **81** for housing a battery **30** and which also functions to help support the seat assembly; steering control levers **32** and **34** which enable the rear drive wheels **43** to be independently drivable in opposite directions at the same time so as to enable the mower to perform zero radius turns about a vertical zero radius turning axis **65**; vertically extending support plates **14** which support console **36** and handle grips **32–34**; and deck lift lever **82** which enables the cutter deck assembly **12** together with the engine deck **31** to be raised and lowered together in order to adjust the height of the mower cut.

For example, when deck lift lever **82** is pulled upwardly, the cutter deck assembly **12** together with the engine deck **31** (and engine) is raised so as to increase the height of the mower cut. Chain linkage **83** suspends the deck assembly **12** and **31** and enables it to be raised and lowered in accordance with the position of lever **82**.

Further regarding the deck lift system, in the embodiment of FIGS. **9–13**, **21**, **22**, and **26–27**, when deck lift lever **82** is pulled upwardly in a clockwise pivoting fashion (“clockwise” as defined from the port side of the mower as in FIGS. **10** and **11**) by an operator, this causes a rod **99** (see FIG. **12**) traversing the mower frame to also rotate in a clockwise direction. This rod, attached to deck lift rods **100** on either side of the mower, causes rods **100** to be pulled toward the rear of the mower so that lift brackets pivot counterclockwise about pivot axes **101** in order to lift the cutter deck assembly **12** together with the engine deck **31** and engine upwardly via chains **83** in order to raise the cut of the mower. In a similar manner, when lever **82** is lowered from a locked position, the weight of the deck assemblies and engine causes brackets **100** to rotate clockwise (“clockwise” as defined in, for example, FIG. **11**) about axes **101** and rods **100** to move in a forward direction so that the cutter deck assembly **12** is lowered along with the engine deck **31** and engine. In this respect, control arms **130** (best shown in operation in FIG. **21**) maintain the lateral position of the cutter deck assembly **12** and engine deck **31** (and the engine) during lower/raising by the deck lift system. As can be seen in FIG. **21**, control arms **30** in this embodiment are much shorter than those in the ‘020 patent, so that mowers according to certain embodiments of this invention are better able to withstand side loads applied to the deck assemblies.

Battery(ies) **30** (e.g., a DC battery) supplies electric power to mower components such as electric starting systems, optional lights, etc. As shown in FIGS. **13–16**, at least a portion of battery **30** is located at an elevation below an elevation of a rotational axis (e.g., see **44** in FIG. **1**) of one or both rear drive wheels **43**, so as to lower the overall center of gravity of the mower. Moreover, in certain embodiments of this invention, the vertically oriented zero radius turning axis may intersect the battery due to its advantageous location. Because battery **30** and battery housing **81** are located on or above the foot platform **9** as shown in FIGS. **9**, **10**, **12–18**, respective foot areas for respective feet of the

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operator are provided on opposite sides of the battery housing 81 on platform 9. Thus, battery 30 is preferably at least partially located between feet (or feet areas) of the operator during normal mower operation regardless of whether the operator is operating the mower in a standing mode while standing upright on platform 9 or operating the mower in a sitting mode while sitting on seat 1 with feet still on the platform 9 on opposite sides of the battery 30 (feet of the mower operator fit on the platform 9 on opposite sides of the battery 30 in a similar manner as shown in FIGS. 1, 2, 5 and 7).

Referring in particular to FIGS. 14–18, the seat assembly of this mower is unique and has several improvements relative to conventional seat assemblies. In particular, the seat assembly structure according to this fourth embodiment of this invention includes: seat 1; rear seat pivot 102; seat adjustment frame 103 including a pair of approximately parallel sidewalls connected by a cross member for enabling the seat 1 to be moved forward/rearward via slots 105; front seat spring 104 for operator comfort; front seat pivot 106 which enables the seat assembly to pivot between deployed and stowed positions; seat adjustment release lever 107; upper seat support frame member 108 including a pair of approximately parallel sidewalls 108a and 108b connected by cross member 108c; spring bolt 109 which extends through and along an axis of rear seat spring 110; lower seat support frame member 111 including a spring receiving surface 111a, a pair of approximately parallel sidewalls 111b and 111c, and a cross member 111a/111d connecting the sidewalls 111b and 111c; slots 112 for enabling frame 111 to move upward/downward so as to adjust the vertical position of seat 1; battery housing structure 81 including battery box rear wall 113, battery box bottom wall 121, battery box front wall 122, and pivoting battery box lid or top wall 124 which pivots at 124a (preferably, battery box sidewalls 115 are approximately parallel to another, as are the top wall 124 and the bottom wall 121 of the battery box); and finally tractor frame structure 114. Spring 104 is located under a front portion of seat 1 and the other spring 110 is located at least partially between seat supports 108 and 111. Preferably, support frames 108 and 111 are connected (the word “connected” herein means either directly connected or indirectly connected) to one another via pivot 106. Moreover, support frame 111 is connected to either the tractor frame or a deck structure via slots 112 with bolts therethrough so that the position of the seat assembly may be selectively adjusted.

In certain embodiments, foot platform 9 extends underneath of battery box 81 and defines a bottom wall thereof for supporting the battery thereon. Alternatively, the battery box 81 itself may include a bottom wall for supporting the battery 30 that is separate and distinct from the foot platform 9 upon which the operator may stand or rest his/her feet.

Tractor frame structure 114 includes (e.g., see FIGS. 14 and 17–20): tractor frame left sidewall 114a, tractor frame right sidewall 114b, tractor frame rear cross bar 116 connecting the two tractor frame sidewalls at respective rear edges thereof, battery box sidewalls 115, battery box rear wall 113, battery box bottom wall 121, battery box front wall 122, tractor frame cross member 123 for extending between and connecting/supporting the sidewalls, and control arm support tabs 131. Preferably, tractor frame sidewalls 114a

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and 114b are approximately parallel (i.e., parallel plus/minus 10 degrees in either direction) to one another, and cross member 123 is approximately perpendicular to the tractor frame sidewalls.

As best shown in FIGS. 12–13, the unique shape and structure of tractor frame 114 enables wheel motors 45 which drive the respective rear drive wheels to be mounted to the respective exterior surfaces of the tractor frame sidewalls 114a and 114b. Wheel motors 45 are preferably mounted to the tractor frame 114 because the engine deck 31 and cutter deck assembly 12 move up/down selectively due to the deck lift system (i.e., it is not desirable to have the wheel motors moving up/down relative to the wheels/tires themselves). As shown in FIGS. 19–20, wheel motors (WM) 45 may be mounted to the exterior surfaces of the respective tractor frame sidewalls 114a and 114b at positions “WM.” The parallel sidewalls of the tractor frames provide an excellent mounting position for the wheel motors 45. This also means that the rear drive wheels 43 are mounted to sidewalls 114a and 114b and are supported thereby (instead of to the engine deck as in certain conventional mowers). Additionally, the hydro pumps may be mounted on a top surface of the tractor frame 114 or alternatively may be mounted on the engine deck 31.

As shown best in FIGS. 19 and 21, cross member or front wall 123 of the tractor frame is shaped so as to include approximately parallel portions 123a and 123b that are connected by angled portion 123c. Intermediate angled portion 123c forms an angle of from about 30–85 degrees with portion 123b, and an angle of from about 30–85 degrees with portion 123a. As shown in FIG. 21, the presence of angled portion 123c enables portions 123a and 123b to be approximately parallel to one another yet offset from one another thereby creating space 123d above angled portion 123c where the rear edge of engine deck 31 can move up and down during cutting height adjustment initiated by the deck lift system. In other words, the presence of angled portion 123 creates space 123d so that the space above the toes of the operator (the toes would be at area 123e) may be used for enabling the engine deck to move up/down.

Referring to FIGS. 14–17, seat 1 is selectively movable between a deployed position and a stowed or non-deployed position. Seat 1 is illustrated in a deployed position in FIGS. 14 and 15, and in a stowed or non-deployed (i.e., folded up) position in FIG. 16. In FIG. 17 and FIG. 18, the seat 1 is halfway between the two positions and is in the process of either being deployed or stowed.

In order to move seat 1 from its deployed position (FIGS. 14–15) to its stowed position (FIG. 16), the seat 1 along with seat adjustment frame 103, upper seat support ID frame member 108, and springs 104, 110 are pivoted forward (i.e., in a counterclockwise direction as defined in FIG. 15) about pivot axis 106 until the seat 1 reaches its stowed or non-deployed position as shown in FIG. 16. Likewise, in order to move seat 1 from its stowed position (see FIG. 16) to its deployed position (see FIGS. 14–15), seat 1 along with seat adjustment frame 103, upper seat support frame member 108, and springs 104 and 110 are pivoted clockwise about front seat pivot axis 106 until the pivoting movement is stopped by the bottom of spring 110 contacting surface 111a

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so that the seat thus reaches its deployed position as shown in FIGS. 14–15. As can be seen, springs 104 and 110 are connected to members 103 and 108, respectively, and thus move along with the seat 1 when the seat pivots between deployed and stowed positions.

As can be seen in FIGS. 14–17, seat 1 along with frame 108 pivot about axis 106 over a range of at least 45 degrees, more preferably at least about 60 degrees, to enable the seat to move from a deployed to a stowed position, or vice versa (even more preferably from about 70–120 degrees, and most preferably from about 75–100 degrees). This rather high degree of angular pivoting movement is enabled by the efficient and compact nature of the seat assembly. It is stressed that the particulars of the seat assembly shown in FIGS. 14–17 are for purposes of example only, and are not intended to be limiting; in other words, other types of seat structures consistent with one or more teachings herein may also be used in other embodiments of this invention.

As can be seen, front seat spring 104 and rear seat spring 110 are provided for operator comfort and function in a shock absorbing manner when the mower is being operated. Additionally, rear seat spring 110 (which is attached to upper seat support frame 108, and not to lower seat support frame 111) prevents seat 1 and support frame member 108 from pivoting too far rearwardly in the clockwise direction about pivot axis 106 (i.e., “clockwise” pivoting is defined as viewed in FIG. 15). In other words, when seat 1 is being moved from a stowed position to a deployed position, the bottom of spring 110 eventually hits the spring contacting surface 111a of support frame member 111 thereby stopping the clockwise movement of seat 1 and frame member 108 about axis 106 in order to define the deployed position for seat 1. In certain exemplary embodiments, surface 111a includes an aperture defined therein for receiving an end or head of bolt 109 when spring 110 comes to rest on surface 111a (as the seat goes down, the head of the bolt goes through the aperture but the washer and spring do not go through the aperture; the washer is between the bolt head and the spring end). Additionally, bolt 109 may be adjusted in order to both selectively change the biasing force provided by spring 110 and/or to adjust the angle at which seat 1 is normally located absent an operator.

As can be seen in FIGS. 14–18, seat 1 folds upwardly (toward its stowed position) and downwardly (toward its deployed position) about fixed axis 106, without the need for any pins to be pulled or the like. Springs 104 and 110 are positioned so that the entire seat unit (seat 1 along with springs 104 and 110, and frame members 103 and 108) pivots about axis 106 in a unitary manner. Additionally, the location of pivot axis 106 is located far enough rearwardly on the mower so that seat 1 is prevented from hitting supports 114 when pivoted to its stowed position (although the seat may come to rest up against same in the stowed position in certain embodiments of this invention). Moreover, pivot axis 106 is located at an elevation high enough so that the seat structure including seat 1 and frame members 103 and 108 can be made to have a low enough profile such that the mower does not prevent the seat from being moved between stowed and deployed positions. Pivot 106 is forward enough to enable the overall mower length to be rather short, but back far enough for the seat to clear the

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handle assembly. In this regard, pivot axis 106 is preferably located at an elevation greater than that of foot platform 9 and at an elevation also greater than that of top battery box wall 124. In most preferred embodiments, fixed pivot axis 106 is located at an elevation greater than the elevation of the rotational axis of the rear drive wheels 43, although it may be located lower than same in certain embodiments. Additionally, fixed seat pivot axis 106 is preferably located rearwardly of the rear drive wheel axis (of one or both rear drive wheels 43) and optionally may also be located rearwardly of the rear edge of foot platform 9.

As shown in FIG. 15, springs 104 and 110 have respective axes which are approximately parallel to one another both in deployed and stowed positions. In this regard, the respective axes of springs 104 and 110 define an angle with respect to one another of from about 0 to 15 degrees as viewed from the side as in FIG. 15, more preferably of from about 0 to 8 degrees. This approximately parallel alignment of the axes of springs 104 and 110 has been found to provide for a more comfortable ride for the seated operator and for an efficient seat assembly system. Additionally, while only a single spring 104 and a single spring 110 are shown in FIGS. 14–18, it will be recognized by those skilled in the art that additional springs may be provided.

Pivots 102 and 106 are approximately parallel to one another, and may enable the seat to pivot in opposite directions. As for rear seat pivot 102, it enables seat 1 to pivot in directions 90 about axis 102. Thus, pivot axis 102 functions to enable spring 104 to cushion the ride of an operator seated on seat 1 especially in the forward direction when the operator is leaning forward on the seat 1. In preferred embodiments, rear seat pivot axis 102 is located at an elevation above front pivot axis 106, and is also located rearwardly of both axis 106 and rearwardly of the rear edge of rear drive wheels 43 (although this need not be the case in all embodiments of this invention).

The position of seat 1 may also be adjusted upwardly and downwardly via slots 112, as well as forwardly/rearwardly via slots 105. The selective adjustability of seat 1 is advantageous in that the seat assembly may more easily accommodate operators of different sizes.

The positioning of battery 30 in box or housing 81 at a location at least partially below an axis of at least one of the rear drive wheels enables a lower center of gravity of the mower thereby enabling safe mower operation. The lower the center of gravity, the less likely the mower is to tip when travelling on hills or the like. Moreover, positioning of battery 30 between the feet of the operator above platform 9 utilizes space which otherwise may not have been used. This location of the battery also enables it to be positioned further rearwardly than would otherwise have been permitted thereby achieving the result of moving the center of gravity of the mower further rearwardly in order to provide for smoother and more efficient mower operation.

Yet another advantage associated with the seat structure shown in FIGS. 14–18 is that the operator can operate the mower in a standing mode (i.e., the operator stands upright on platform 9) regardless of whether seat 1 is in a deployed position (FIGS. 14–15) or in a stowed or non-deployed position (FIG. 16). Thus, the operator may easily lift up off of the seat when going up hills and quickly sit back down if

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desired. Alternatively, if the operator desires to operate the mower in a standing mode for an extended period of time, the operator can stow the seat as shown in FIG. 16 and thereafter operate the mower while standing on platform 9. The low profile of the seat and compact nature of the seat assembly as illustrated in FIGS. 14–18 enables the seat assembly to be small enough so that it does not interfere with operation of the mower by a standing operator regardless of whether the seat 1 is deployed or not.

Another unique feature associated with the fourth embodiment of this invention relates to control arms 130 and is best illustrated in FIGS. 21–22 and 26–27. It is again noted that cutter deck assembly 12 is rigidly affixed to engine deck 31 (with the engine thereon) so that the two deck assemblies may be raised and lowered together as one unitary structure by the deck lift system of this mower (e.g., as initiated by deck lift lever 82). End 92 of each control arm 130 is pivotally connected to the cutter deck assembly 12 while the other end 93 of each control arm is pivotally connected to the tractor frame structure 114 at pivot axis 91 (e.g., see FIGS. 21–22). Control arms 130 function to maintain the desired lateral position of deck assemblies 12, 31 throughout their range of movement. In this regard, control arms 130 are pivotally connected to, and extend between, both cutter deck assembly 12 on the one hand and tractor frame 114 on the other hand. Thus, when deck assemblies 12 and 31 are raised by the deck lift system, control arms 130 pivot upwardly about axis 91 in direction “A” (see FIG. 26). Axis 91 is defined by the apertures or holes provided in control arm support tabs 131. In a similar manner, when the deck assemblies 12, 31 are lowered by the deck lift system, control arms 130 pivot downwardly in direction “B” (i.e., counterclockwise as shown in FIG. 21) about pivot axis 91.

As shown in FIGS. 26–27, control arms 130 may be of different lengths in different embodiments of this invention. However, in both the FIG. 26 and the FIG. 27 embodiments, control arms 130 are significantly shorter than conventional control arms. In particular, with regard to FIG. 26, control arms 130 according to this invention are preferably short enough so that they must pivot at least about 29° (see the angle Φ in FIG. 26) about axis 91 in order to move the cutter deck assembly upwardly or downwardly over a vertical distance “d” of five (5) inches. Preferably, in order to move the cutter deck assembly 12 (and thus also the engine deck and engine) up or down five inches, the control arms 130 according to this invention preferably are pivoted about axis 91 from about 27–80°, more preferably from about 30–60°, and most preferably from about 30–50° (theses are the full range of movement for the control arms 130 for cutting positions of the cutter deck and corresponding blades). In other embodiments of this invention, pivoting of the control arms 130 fifteen (15) degrees about axis 91 causes the cutter deck assembly 12 to move either vertically upward or vertically downward no more than about 2.5 inches, and more preferably no more than about 2.0 inches and most preferably no more than about 1.8 inches (these vertical distances “d” are measured irrespective of how much the deck may move laterally forward or rearward during the lift due to the pivoting of arms 130 about axis 91).

The shorter control arms 130 of this invention enable a more compact and efficient mower. Moreover, the shorter

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control arms enable the mower to withstand additional sideload (e.g., when deck assembly 112 is impacted from the side). The longer the arms, the more adverse the effects of sideload. Shorter control arms are enabled in accordance with the instant invention because the cutter deck assembly 12 is rigidly connected to the engine deck 31 and the two deck assemblies move upwardly and downwardly together in order to adjust the cut height of the mower. Conventional deck lift systems typically require longer control arms because the cutter deck assembly is separate from the engine and the two do not move upwardly and downwardly together during deck lift operations. Thus, because conventional mowers have engines separate from the cutter deck, it is undesirable to have to significantly compensate the belt drive system for significant back and forth lateral movement which accompanies large angular pivoting movements of control arms. Because our engine deck and engine is moved along with the cutter deck assembly, the instant invention can afford to have the deck assemblies move laterally rearward/forward along with up/down movement and thus can accommodate shorter control arms 130 because the belt drive system between the engine drive shaft and the cutter blades is not changed (i.e., the distance between the two remains approximately constant) during deck lifting/lowering operations.

FIG. 22 is an exploded view of a control arm which may be utilized in conjunction with this invention. Control arm 130 includes adjustable rod end 130a (ball socket), nut 130b for locking rod end 130a from movement (i.e., to prevent wear), control arm weldment 130c, shock absorber rubber (e.g., neoprene) bushings 130d, and spanner pipe or tube 130e which extends through bushings 130d and the elongated tubular section of control arm weldment 130c.

Yet another unique aspect of this fourth embodiment of this invention is best illustrated in FIGS. 23–25 and 28. In particular, an angled section at 12a of the cutter deck assembly 12 between lobes 12b and 12c is cut out or removed and covered up by a fill or plug plate 141. The corner defined by 95 and 140 that is removed at area 12a enables the height or profile of the cutter deck assembly at that location to be reduced. The lower profile of the cutter deck assembly at the location of plate 141 enables more room for the engine clutch which extends downwardly from a position above plate 141 (e.g., see FIGS. 25 and 28). Clutch 142 is illustrated from above in FIG. 25.

The cutter deck includes top deck surface 95 which defines the plane of the cutter deck, as well as deck sidewall 140 which extends generally downward from top surface 95. FIG. 28 is a cross-sectional view of the cutter deck assembly 12 taken along the center of plate 141 of FIG. 23. Referring in particular to FIG. 28, plate 141 covers the cutout or hole in the cutter deck by extending between and connecting cutter deck sidewall 140 with cutter deck top surface 95. Welds 96 or any other suitable means may be utilized to secure plate 141 to the cutter deck in this regard. Plate 141 preferably defines an angle Ω of from about 15–75 degrees with top surface 95 of the cutter deck, more preferably of from about 25–65 degrees, and most preferably an angle Ω of from about 35–55 degrees. Plate 141 is located at the rear center edge of the cutter deck between lobes 12b and 12c. Again, this enables clutch 142 as shown in FIGS. 25 and 28

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to be located at a lower elevation than would otherwise be possible. The provision of plate **141** (as opposed to a right angle connection between cutter deck members **95** and **140**) also enables easier installation/removal of clutch **142** and the blade belt driven by the clutch. By enabling the clutch and thus the engine to be located at a lower elevation, a lower center of gravity of the mower is possible.

Once given the above disclosure, many other features, modifications, and improvements will become apparent to the skilled artisan. Such other features, modifications, and improvements are therefore considered to be a part of this invention, the scope of which is to be determined by the following claims.

What is claimed is:

1. A self-propelled power lawn mower comprising:

first and second rear drive wheels that are independently driveable so as to enable the mower to conduct approximate zero radius turns about a zero radius turning axis; a foot platform for supporting at least one foot of an operator of the mower, said foot platform being located at an elevation less than an elevation of a top edge of at least one of said rear drive wheels; a deck lift system for raising and lowering a cutter deck assembly, an engine deck, and an engine together as one unit in order to adjust a blade cutting height of the mower;

control arms pivotally attached to at least one of the cutter deck and engine deck in order to provide lateral positioning of the cutter deck assembly and engine deck during the raising and lowering; and

wherein said control arms are short enough in length so that pivoting of the control arms an angle Φ of fifteen (15) degrees either upward or downward during raising or lowering of the cutter deck assembly causes the cutter deck assembly to move a vertical distance "d" no more than about 2.5 inches.

2. The mower of claim 1, wherein said control arms are short enough in length so that pivoting of the control arms an angle Φ of fifteen (15) degrees either upward or downward during raising or lowering of the cutter deck assembly causes the cutter deck assembly to move a vertical distance "d" no more than about 2.0 inches.

3. The mower of claim 2, wherein said control arms are short enough in length so that pivoting of the control arms an angle Φ of fifteen (15) degrees either upward or downward during raising or lowering of the cutter deck assembly causes the cutter deck assembly to move a vertical distance "d" no more than about 1.8 inches.

4. The mower of claim 1, wherein a pivot axis about which the control arms pivot is defined by apertures in control arm support tabs provided on a tractor frame structure.

5. The mower of claim 4, wherein the control arms are pivotally connected between said cutter deck assembly and a tractor frame structure, so that a first end of each control arm is pivotally connected to the tractor frame structure and

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a second end of each control arm is pivotally connected to the cutter deck assembly.

6. The mower of claim 5, wherein the control arms are pivotally connected to a front wall of the tractor frame structure via control arm support tabs, each of said control arm support tabs being rigidly affixed to the tractor frame structure and having an aperture defined therein for defining a pivot axis of the corresponding control arm.

7. The mower of claim 1, wherein said engine deck is rigidly affixed to said cutter deck assembly so that a plane defined by said engine deck upon which the engine is mounted is at an elevation above an elevation defined by a top surface of said cutter deck.

8. The mower of claim 1, wherein a rear edge of said engine deck extends over top of, and rearwardly of, rearwardmost ends of said control arms.

9. A power mower comprising:

at least one drive wheel;

an engine deck structure upon which an engine is mounted;

a cutter deck assembly for housing one or more cutting blades for cutting grass;

a deck lift system for raising and lowering the cutter deck assembly, the engine deck, and the engine together as a unit in order to adjust a blade cutting height of the mower; and

wherein a control arm, for helping provide lateral positioning of the cutter deck assembly during the raising and lowering, is short enough in length so that pivoting of the control arm an angle Φ of fifteen (15) degrees during raising or lowering of the cutter deck assembly causes the cutter deck assembly to move a vertical distance "d" of no more than about 2.5 inches.

10. The mower of claim 9, wherein said control arm is short enough in length so that pivoting of the control arm an angle Φ of fifteen (15) degrees during raising or lowering of the cutter deck assembly causes the cutter deck assembly to move a vertical distance "d" no more than about 2.0 inches.

11. The mower of claim 9, wherein said control arm is short enough in length so that pivoting of the control arm an angle Φ of fifteen (15) degrees either upward or downward during raising or lowering of the cutter deck assembly causes the cutter deck assembly to move a vertical distance "d" no more than about 1.8 inches.

12. The mower of claim 9, wherein a pivot axis about which the control arm pivots is defined by apertures in control arm support tabs provided on a tractor frame structure.

13. The power mower of claim 9, wherein a first end of the control arm is pivotally attached to the cutter deck assembly and a second end of the control arm is pivotally attached to a tractor frame structure.

14. The power mower of claim 13, wherein the tractor frame structure supports each of a foot platform and a seat for an operator.

* * * * *

CERTIFICATE OF FILING AND SERVICE

I hereby certify that on this 29th day of September, 2014, I caused this Brief of Appellant to be filed electronically with the Clerk of the Court using the CM/ECF System, which will send notice of such filing to the following registered CM/ECF users:

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Upon acceptance by the Clerk of the Court of the electronically filed document, the required number of copies of the Brief of Appellant will be hand filed at the Office of the Clerk, United States Court of Appeals for the Federal Circuit in accordance with the Federal Circuit Rules.

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CERTIFICATE OF COMPLIANCE

1. This brief complies with the type-volume limitation of Fed. R. App. P. 28.1(e)(2) or 32(a)(7)(B) because:

[X] this brief contains [7,268] words, excluding the parts of the brief exempted by Fed. R. App. P. 32(a)(7)(B)(iii), *or*

[] this brief uses a monospaced typeface and contains [*state the number of*] lines of text, excluding the parts of the brief exempted by Fed. R. App. P. 32(a)(7)(B)(iii).

2. This brief complies with the typeface requirements of Fed. R. App. P. 32(a)(5) and the type style requirements of Fed. R. App. P. 32(a)(6) because:

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Dated: September 29, 2014

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